Working File Folder - NSR Permit

Company Name: Burlington Resources Oil + Gas Company LP

County: DeWitt

Account: ——— Permit No: 109919

RN: 106132263 Filing Date: 7/11/13

100585489

109919

PERMITS

AIR PA

CFR

TITAN Engineering, Inc.
Environmental Consulting and Management

June 24, 2013

Air Permits Initial Review Team (APIRT) Section, MC 161
Texas Commission on Environmental Quality
12100 Park 35 Circle, Building C, Third Floor
Austin, Texas 78753

via FedEx

Subject: Oil and Gas Standard Permit Registration
Burlington Resources Oil & Gas Company LP
DeWitt Central Facility 3
DeWitt County, Texas
CN602989436, RN106432263

JUN 2 7 2013
APIRT

Dear Mr. Johnny Bowers:

On behalf of Burlington Resources Oil & Gas Company LP (Burlington), TITAN Engineering, Inc. (TITAN) is submitting this Oil and Gas Standard Permit (SP) Registration to the Texas Commission on Environmental Quality (TCEQ) for operations at DeWitt Central Facility 3 (the Site) located near Yorktown in DeWitt County, TX. Upon authorization, this standard permit will authorize the following project:

- One (1) compressor engine and associated starter vent and blowdown;
- One (1) glycol dehydration unit;
- Two (2) controlled atmospheric condensate storage tanks and associated loading;
- One (1) controlled atmospheric produced water storage tank and associated loading;
- One (1) controlled atmospheric slop storage tank and associated loading;
- One (1) flare combustion control device; and,
- Piping and fugitive components.

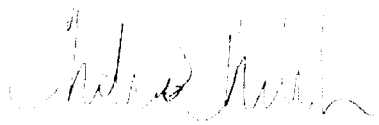
TITAN and Burlington Resources believe that the Site and its associated air emissions meet the requirements of the TCEQ Non-Rule Standard Permit for Oil and Gas Handling and Production Facilities and 30 TAC §116.610, §116.611, §116.614, and §116.615. A PBR Registration (Permit number 103471) was submitted for this site. With the modifications made to the site indicated in this submittal, it was later determined that a different level of authorization was required. An initial notification for a New Project was submitted to the TCEQ via the STEERs ePermitting system on May 6, 2013.

This Standard Permit Registration has been prepared in accordance with TCEQ guidance and includes the following attachments:

- Attachment 1 presents a process description, area map, receptor map, process flow diagram, and plot plan;
- Attachment 2 contains the applicable TCEQ forms and tables;
- Attachment 3 presents emission rate calculations;
- Attachment 4 describes how the Site qualifies for Standard Permit;
- Attachment 5 includes an impacts evaluation; and
- Attachment 6 includes supporting documentation.

TITAN and Burlington would like to collectively thank you in advance for your review and concurrence with this Oil and Gas Standard Permit Registration. If you have any questions regarding the information presented in this letter and attachments, please do not hesitate to contact Mr. James Woodall at 832-486-6508 or james.woodall@conocophillips.com or me at 469-365-1168 or cchermak@titanengineering.com.

Sincerely,
TITAN Engineering, Inc.



Christina Chermak
Project Manager

Attachments

cc: Ms. Rosario Torres, TCEQ Region 14 – Corpus Christi
Mr. James Woodall, Sr. Environmental Specialist, ConocoPhillips Company
TCEQ Revenue Section, MC-214, Bldg. A, Third Floor, Austin, Texas 78753 (Form PI-1S, CORE Data form, and fee only)

ATTACHMENT 2
TCEQ FORMS AND TABLES

OIL AND GAS STANDARD PERMIT REGISTRATION

DEWITT CENTRAL FACILITY 3

BURLINGTON RESOURCES OIL & GAS COMPANY LP

TCEQ Use Only

TCEQ Core Data Form

For detailed instructions regarding completion of this form, please read the Core Data Form Instructions or call 512-239-5175.

SECTION I: General Information

1. Reason for Submission *(If other is checked please describe in space provided)*

☑ New Permit, Registration or Authorization *(Core Data Form should be submitted with the program application)*

☐ Renewal *(Core Data Form should be submitted with the renewal form)* ☐ Other

2. Attachments **Describe Any Attachments:** *(ex. Title V Application, Waste Transporter Application, etc.)*

☑ Yes ☐ No — Standard Permit Registration

3. Customer Reference Number *(if issued)*: CN 602989436

Follow this link to search for CN or RN numbers in Central Registry**

4. Regulated Entity Reference Number *(if issued)*: RN RN106432263

SECTION II: Customer Information

5. Effective Date for Customer Information Updates (mm/dd/yyyy):

6. Customer Role (Proposed or Actual) – *as it relates to the Regulated Entity listed on this form. Please check only one of the following:*

☐ Owner ☐ Operator ☑ Owner & Operator
☐ Occupational Licensee ☐ Responsible Party ☐ Voluntary Cleanup Applicant ☐ Other: _____

7. General Customer Information

☐ New Customer ☐ Update to Customer Information ☐ Change in Regulated Entity Ownership
☐ Change in Legal Name (Verifiable with the Texas Secretary of State) ☑ No Change**

If "No Change" and Section I is complete, skip to Section III – Regulated Entity Information.

8. Type of Customer:	☐ Corporation	☐ Individual	☐ Sole Proprietorship- D.B.A
☐ City Government	☐ County Government	☐ Federal Government	☐ State Government
☐ Other Government	☐ General Partnership	☐ Limited Partnership	☐ Other:

9. Customer Legal Name *(If an individual, print last name first: ex: Doe, John)* | *If new Customer, enter previous Customer below* | *End Date:*

10. Mailing Address:

City	State	ZIP	ZIP + 4

11. Country Mailing Information *(if outside USA)*

12. E-Mail Address *(if applicable)*

13. Telephone Number | **14. Extension or Code** | **15. Fax Number** *(if applicable)*

16. Federal Tax ID *(9 digits)* | **17. TX State Franchise Tax ID** *(11 digits)* | **18. DUNS Number** *(if applicable)* | **19. TX SOS Filing Number** *(if applicable)*

20. Number of Employees

☐ 0-20 ☐ 21-100 ☐ 101-250 ☐ 251-500 ☐ 501 and higher

21. Independently Owned and Operated?

☐ Yes ☐ No

SECTION III: Regulated Entity Information

22. General Regulated Entity Information *(If 'New Regulated Entity" is selected below this form should be accompanied by a permit application)*

☐ New Regulated Entity ☐ Update to Regulated Entity Name ☑ Update to Regulated Entity Information ☐ No Change** *(See below)*

**If "NO CHANGE" is checked and Section I is complete, skip to Section IV, Preparer Information.

23. Regulated Entity Name *(name of the site where the regulated action is taking place)*

DeWitt Central Facility 3

24. Street Address of the Regulated Entity: *(No P.O. Boxes)*							
	City		**State**		**ZIP**		**ZIP + 4**
25. Mailing Address:	600 N Dairy Ashford						
	Westlake 3, #15012						
	City	Houston	**State**	TX	**ZIP**	77079	**ZIP + 4**

26. E-Mail Address:	james.woodall@conocophillips.com		
27. Telephone Number	**28. Extension or Code**	**29. Fax Number** *(if applicable)*	
(832) 486-6508		832-486-6431	
30. Primary SIC Code (4 digits)	**31. Secondary SIC Code** (4 digits)	**32. Primary NAICS Code** (5 or 6 digits)	**33. Secondary NAICS Code** (5 or 6 digits)
1311		211111	

34. What is the Primary Business of this entity? *(Please do not repeat the SIC or NAICS description.)*

Natural Gas Production

Questions 34 – 37 address geographic location. Please refer to the instructions for applicability.

35. Description to Physical Location:	From the intersection of TX-72 and TX-119 in Yorktown, head north on TX-119 and travel 8.9 miles. Turn left on Frank Kozielski Rd and then right on Garfield Road continue 1.2 miles. Keep a slight right to continue on George Klein Road for 0.6 miles. Site entrance will be on right.

36. Nearest City	**County**	**State**	**Nearest ZIP Code**
Yorktown	DeWitt	TX	78164

37. Latitude (N) In Decimal:			**38. Longitude (W) In Decimal:**		
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
29	2	59.24	97	39	51.53

39. TCEQ Programs and ID Numbers Check all Programs and write in the permits/registration numbers that will be affected by the updates submitted on this form or the updates may not be made. If your Program is not listed, check other and write it in. See the Core Data Form instructions for additional guidance.

☐ Dam Safety	☐ Districts	☐ Edwards Aquifer	☐ Industrial Hazardous Waste	☐ Municipal Solid Waste
☑ New Source Review – Air	☐ OSSF	☐ Petroleum Storage Tank	☐ PWS	☐ Sludge
☐ Stormwater	☐ Title V – Air	☐ Tires	☐ Used Oil	☐ Utilities
☐ Voluntary Cleanup	☐ Waste Water	☐ Wastewater Agriculture	☐ Water Rights	☐ Other:

SECTION IV: Preparer Information

40. Name:	James Woodall	**41. Title:**	Sr. Environmental Specialist

42. Telephone Number	**43. Ext./Code**	**44. Fax Number**	**45. E-Mail Address**
(832) 486-6508	N/A		james.woodall@conocophillips.com

SECTION V: Authorized Signature

46. By my signature below, I certify, to the best of my knowledge, that the information provided in this form is true and complete, and that I have signature authority to submit this form on behalf of the entity specified in Section II, Field 9 and/or as required for the updates to the ID numbers identified in field 39.

(See the Core Data Form instructions for more information on who should sign this form.)

Company:	Burlington Resources Oil & Gas Company LP	**Job Title:**	Manager of Production Operations- GCBU
Name *(In Print)* :	Randy Black	**Phone:**	(832) 486-6508
Signature:		**Date:**	1/16/13

Texas Commission on Environmental Quality
Form PI-1S
Registrations for Air Standard Permit
(Page 1)

I. Registrant Information		
A. Is a TCEQ Core Data Form (TCEQ Form No. 10400) attached? Core Data Form required for Standard Permits 6004, 6006, 6007, 6008, and 6013.		☒ YES ☐ NO
Customer Reference Number (CN): CN602989436		
Regulated Entity Number (RN): RN106432263		
B. Company or Other Legal Customer Name (must be same as Core Data "Customer"):		
Burlington Resources Oil & Gas Company LP		
Company Official Contact Name: Randy Black		
Title: Manager of Production Operations - GCBU		
Mailing Address: 600 N Dairy Ashford, Westlake 3, #15012		
City: Houston	State: TX	ZIP Code: 77079
Phone No.: 832-486-6508	Fax No.: 832-486-6431	E-mail Address: randy.c.black@conocophillips.com
C. Technical Contact Name: James Woodall		
Title and Company: Sr. Environmental Specialist		
Mailing Address: 600 N Dairy Ashford, Westlake 3, #15012		
City: Houston	State: TX	ZIP Code: 77079
Phone No.: 832-486-6508	Fax No.: 832-486-6431	E-mail Address: james.woodall@conocophillips.com
D. Facility Location Information (Street Address):		
If no street address, provide clear driving directions to the site in writing:		
From the intersection of TX-72 and TX-119 in Yorktown, head north on TX-119 and travel 8.9 miles. Turn left on Frank Kozielski Rd and then right on Garfield Road continue 1.2 miles. Keep a slight right to continue on George Klein Road for 0.6 miles. Site entrance will be on right.		
City: Yorktown	County: DeWitt	ZIP Code: 78164
Latitude (nearest second): 29°02'59.24"	Longitude (nearest second): 97°39'51.53"	
II. Facility and Site Information		
A. Name and Type of Facility: DeWitt Central Facility 3		☒ Permanent ☐ Temporary
B. Type of Action:		
☒ Initial Application	☐ Renewal	☐ Change to Registration
☒ Registration No.: 109919	☐ Expiration Date:	
C. List the Standard Permit Claimed: 6002		
Description: Oil and Gas Facilities		

Texas Commission on Environmental Quality
Registrations for Air Standard Permit
PI-1S
(Page 2)

II.	**Facility and Site Information *(continued)***	
D.	Concrete Batch Plant Standard Permit *(Check one)* ☐ Central Mix ☐ Ready Mix ☐ Specialty Mix ☐ Enhanced Controls for Concrete Batch Plants	
E.	Proposed Start of Construction:	Length of Time at the Site:
F.	Is there a previous Standard Exemption or Permit by Rule for the facilities in this registration? *(Attach details regarding changes)*	☒ YES ☐ NO
If "YES," list Permit No.: 103471		
G.	Are there any other facilities at this site which are authorized by an air Standard Permit?	☐ YES ☒ NO
If "YES," list Permit No.:		
H.	Are there any other air preconstruction permits at this site?	☐ YES ☒ NO
If "YES," list Permit No.:		
	Are there any other air preconstruction permits at this site that would be directly associated with this project?	☐ YES ☒ NO
If "YES," list Permit No.:		
I.	TCEQ Account Identification Number (if known):	
J.	Is this facility located at a site which is required to obtain a federal operating permit pursuant to 30 TAC Chapter 122?	☐ YES ☒ NO ☐ To Be Determined
K.	Identify the requirements of 30 TAC Chapter 122 that will be triggered if this Form PI-1S application is approved. ☐ Application for an FOP ☐ FOP Significant Revision ☐ FOP Minor ☐ Operational Flexibility/Off-Permit Notification ☐ Streamlined Revision for GOP ☐ To Be Determined ☒ None	
L.	Identify the type(s) issued and/or FOP application(s) submitted/pending for the site. *(check all that apply)* ☐ SOP ☐ GOP ☐ GOP Application/Revision Application: Submitted or Under APD Review ☐ SOP Application Review Application: Submitted or Under APD Review ☒ N/A	

Texas Commission on Environmental Quality
Registrations for Air Standard Permit
PI-1S
(Page 3)

III. Fee Information		
A. Is a copy of the check or money order attached?		☒ YES ☐ NO
Check/Money Order/Transaction Number:		
Company name on Check: TITAN Engineering, Inc.		
Fee Amount: $850.00		
IV. Public Notice *(If Applicable)*		
A. Is the plant located at a site contiguous or adjacent to the public works project?		☐ YES ☐ NO
B. Name of Public Place:		
Physical Address:		
City:	County:	
C. Small Business Classification:		☐ YES ☐ NO
D. Concrete batch plants with enhanced controls, permanent rock crushers, and animal carcass incinerators shall place a copy of the technically complete application at the appropriate TCEQ regional office only.		
E. Please furnish the names of the state legislators who represent the area where the facility site is located:		
State Senator:		
State Representative:		
F. For Concrete Batch Plants, name of the County Judge for this facility site:		
County Judge:		
Mailing Address:		
City:	State:	ZIP Code:
G. For Concrete Batch Plants, is the facility located in a municipality and/or extraterritorial jurisdiction of a municipality?		☐ YES ☐ NO
If "YES," list the name(s) of the Presiding Officer(s) for the municipality and/or extraterritorial jurisdiction:		
Presiding Officer(s):		
Title:		
Mailing Address:		
City:	State:	ZIP Code:

Texas Commission on Environmental Quality
Registration for Air Standard Permit
Form PI-1S
(Page 4)

V.	**Technical Information Including State and Federal Regulatory Requirements Registrants must be in compliance with all applicable state and federal regulations and standards to claim a Standard Permit.**	
A.	Is confidential information submitted and properly marked with this registration?	☐ YES ☒ NO
B.	Is a process flow diagram and a process description attached?	☒ YES ☐ NO
C.	Is a plot plan attached?	☒ YES ☐ NO
D.	Are emissions data and calculations for this claim attached?	☒ YES ☐ NO
E.	Is information attached showing how the general requirements and applicability (30 TAC 116.610 and 116.615) are met?	☒ YES ☐ NO
F.	Is information attached showing how the specific requirements are met?	☒ YES ☐ NO

VI. Delinquent Fees and Penalties

This form **will not be processed** until all delinquent fees and/or penalties owed to the TCEQ or the Office of the Attorney General on behalf of the TCEQ is paid in accordance with the Delinquent Fee and Penalty Protocol. For more information regarding Delinquent Fees and Penalties, go to the TCEQ Web site at: www.tceq.texas.gov/agency/delin/index.html.

VII. Signature Requirements

The signature below indicates that I have knowledge of the facts herein set forth and that the same are true and correct to the best of my knowledge and belief. I further state that to the best of my knowledge and belief, the project for which application is made will not in any way violate any provision of the Texas Water Code (TWC), Chapter 7, Texas Clean Air Act (TCAA), as amended, or any of the air quality rules and regulations of the Texas Commission on Environmental Quality or any local governmental ordinance or resolution enacted pursuant to the TCAA. I further state that I have read and understand TWC 7.177 and 7.183, which defines ***Criminal Offenses*** for certain violations, including intentionally or knowingly making or causing to be made false material statements or representations in this application, and TWC 7.187, pertaining to ***Criminal Penalties***.

Name: RANDY BLACK
Print Full Name

Signature: RB
Original Signature Required

Date: 6/16/13

CASH ONLY IF ALL *CheckLock*™ SECURITY FEATURES LISTED ON BACK INDICATE NO TAMPERING OR COPYING

TITAN ENGINEERING, INC.
2801 NETWORK BLVD, SUITE 200
FRISCO, TX 75034

BANK OF TEXAS, .
DALLAS, TX
32-1432/1110

25302

6/24/2013

PAY TO THE ORDER OF TCEQ

$ **850.00

Eight Hundred Fifty and 00/100********** DOLLARS

Texas Commission on Environmental Quality
P.O. Box 13088
Austin, Texas 78711-3088

VOID AFTER 90 DAYS

Agency Fee: 84800507-12.002

⑈025302⑈ ⑆111014325⑆ ⑈8092671152⑈

Details on Back. Intuit® *CheckLock*™ Secure Check

TITAN ENGINEERING, INC. 25302

TCEQ 6/24/2013

Date	Type	Reference	Original Amt.	Balance Due	Discount	Payment
6/24/2013	Bill	84800507-12.002	850.00	850.00		850.00
					Check Amount	850.00

Bank of Texas Operati Agency Fee: 84800507-12.002 850.00

Texas Commission on Environmental Quality

OGS New Project Notification for New Registration

Site Information (Regulated Entity)

What is the name of the site to be authorized?	DEWITT CENTRAL FACILITY 3
Does the site have a physical address?	
County	DEWITT
Latitude (N) (##.######)	29.04979
Longitude (W) (-###.######)	-97.664314
Primary SIC Code	1311
Secondary SIC Code	
Primary NAICS Code	211111
Secondary NAICS Code	
Regulated Entity Site Information	
What is the Regulated Entity's Number (RN)?	RN106432263
What is the name of the Regulated Entity (RE)?	DEWITT CENTRAL FACILITY 3
Does the RE site have a physical address?	No
Because there is no physical address, describe how to locate this site:	FR THE INTX OF 72 & 119 IN YORKTOWN HEAD N ON 119 FOR 8.9 MI GO L ON FRANK KOZIELSKI RD THEN R ON GARFIELD RD GO 1.2 MI KEEP SLIGHT R TO STAY ON GEORGE KLEIN RD GO 0.6 MI SITE ON R
City	YORKTOWN
State	TX
ZIP	78164
County	DEWITT
Latitude (N) (##.######)	
Longitude (W) (-###.######)	
What is the primary business of this entity?	NATURAL GAS PRODUCTION

Burling-Customer (Applicant) Information

How is this applicant associated with this site?	Owner Operator
What is the applicant's Customer Number (CN)?	CN602989436
Type of Customer	Corporation
Full legal name of the applicant:	
Legal Name	Burlington Resources Oil & Gas Company LP
Texas SOS Filing Number	14500511

Federal Tax ID	
State Franchise Tax ID	32003073841
DUNS Number	131117566
Number of Employees	501+
Independently Owned and Operated?	Yes
I certify that the full legal name of the entity applying for this permit has been provided and is legally authorized to do business in Texas.	Yes
Responsible Authority Contact	
Organization Name	Burlington Resources Oil & Gas Company LP
Prefix	
First	James
Middle	
Last	Woodal
Suffix	
Title	SR. ENVIRONMENTAL SPECIALIST
Responsible Authority Mailing Address	
Enter new address or copy one from list:	
Address Type	Domestic
Mailing Address (include Suite or Bldg. here, if applicable)	600 N DAIRY ASHFORD RD
Routing (such as Mail Code, Dept., or Attn:)	WESTLAKE 3, #15012
City	HOUSTON
State	TX
ZIP	77079
Phone (###-###-####)	8324866508
Extension	
Alternate Phone (###-###-####)	
Fax (###-###-####)	8324866431
E-mail	JAMES.WOODALL@CONOCOPHILLIPS.COM

Responsible Official Contact

Person TCEQ should contact for questions about this application:	
Same as another contact?	
Organization Name	Burlington Resources Oil & Gas Company LP
Prefix	MR
First	Randy

Middle	
Last	Black
Suffix	
Title	MANAGER OF PRODUCTION OPERATIONS - GCBU
Enter new address or copy one from list:	Burlington Resources Oil & Gas Company LP
Mailing Address	
Address Type	Domestic
Mailing Address (include Suite or Bldg. here, if applicable)	600 N DAIRY ASHFORD RD
Routing (such as Mail Code, Dept., or Attn:)	WESTLAKE 3, #15012
City	HOUSTON
State	TX
ZIP	77079
Phone (###-###-####)	8324866508
Extension	
Alternate Phone (###-###-####)	
Fax (###-###-####)	8324866431
E-mail	RANDY.C.BLACK@CONOCOPHILLIPS.COM

Technical Contact

Person TCEQ should contact for questions about this application:	
Same as another contact?	Burlington Resources Oil & Gas Company LP
Organization Name	Burlington Resources Oil & Gas Company LP
Prefix	MR
First	James
Middle	
Last	Woodal
Suffix	
Title	SR. ENVIRONMENTAL SPECIALIST
Enter new address or copy one from list:	Burlington Resources Oil & Gas Company LP
Mailing Address	
Address Type	Domestic
Mailing Address (include Suite or Bldg. here, if applicable)	600 N DAIRY ASHFORD RD
Routing (such as Mail Code, Dept., or Attn:)	WESTLAKE 3, #15012
City	HOUSTON

State	TX
ZIP	77079
Phone (###-###-####)	8324866508
Extension	
Alternate Phone (###-###-####)	
Fax (###-###-####)	8324866431
E-mail	JAMES.WOODALL@CONOCOPHILLIPS.COM

OGS New Project Notification

1) Select the authorization this site or changes to this site will most likely be authorized under based on expected worst-case operations (including planned MSS activities if MSS emissions are being registered with this project).	6002 - NON RULE 2012-NOV-08
2) What is the lease name submitted to the Railroad Commission (RRC)? If there are well(s) co-located with the site, include the well number(s) assigned by the RRC.	NA
3) Provide a brief process description for this site or description of changes to this site.	The site will collect hydrocarbon liquids from nearby production sites. Low pressure gas will be sent to compression, routed to a dehydration unit and sent down the pipeline. Hydrocarbon liquids are collected and sent offsite periodically.
4) What is the site's latitude? (North)	29.049790
5) What is the site's longitude? (West)	-97.664314
6) What method was used to determine the site's latitude and longitude?	Map
7) Does this business qualify as a small business, non-profit organization, or small government entity?	No

Signature

The signature below indicates to the best of my knowledge that the information submitted is true and complete, and that I have signature authority to submit this application on behalf of the regulated entity.

1. I am James Woodall, the owner of the STEERS account ER020324.
2. I have the authority to sign this data on behalf of the applicant named above.
3. I have personally examined the foregoing and am familiar with its content and the content of any attachments, and based upon my personal knowledge and/or inquiry of any individual responsible for information contained herein, that this information is true, accurate, and complete.
4. I further certify that I have not violated any term in my TCEQ STEERS participation agreement and that I

have no reason to believe that the confidentiality or use of my password has been compromised at any time.

5. I understand that use of my password constitutes an electronic signature legally equivalent to my written signature.
6. I also understand that the attestations of fact contained herein pertain to the implementation, oversight and enforcement of a state and/or federal environmental program and must be true and complete to the best of my knowledge.
7. I am aware that criminal penalties may be imposed for statements or omissions that I know or have reason to believe are untrue or misleading.
8. I am knowingly and intentionally signing OGS New Project Notification for New Registration.
9. My signature indicates that I am in agreement with the information on this form, and authorize its submittal to the TCEQ.

OWNER OPERATOR Signature: James Woodall OWNER OPERATOR

Account Number:	ER020324
Signature IP Address:	138.32.80.20
Signature Date:	2013-05-06
Signature Hash:	AA06BD67D3B72ED49336BE1B65B794CDB78BFA0ECB7C0D5E82BDCEE54CEC562C
Form Hash Code at time of Signature:	CC4648E7CFC2B691C1B3D4BBB05FE029D7366811E715E545CD2D7CAAD2C47616

Fee Payment

Transaction by:	The application fee payment transaction was made by ER025071/Christina I Chermak
Paid by:	The application fee was paid by CHRISTINA CHERMAK
Fee Amount:	$50.00
Paid Date:	The application fee was paid on 2013-05-06
Transaction/Voucher number:	The transaction number is 582EA000141708 and the voucher number is 178380

Submission

Reference Number:	The application reference number is 66157
Submitted by:	The application was submitted by ER025071/Christina I Chermak
Submitted Timestamp:	The application was submitted on 2013-05-06 at 15:11:02 CDT
Submitted From:	The application was submitted from IP address 12.237.12.100
Confirmation Number:	The confirmation number is 69078
Steers Version:	The STEERS version is 5.88

Texas Commission on Environmental Quality
Table 29 Reciprocating Engines

I. Engine Data			
Manufacturer: Caterpillar	Model No. G3516TALE	Serial No. 410963	Manufacture Date: 9/28/2005
Rebuilds Date: N/A	No. of Cylinders: 16	Compression Ratio: 8:0:1	EPN: COMP-01

Application: ☒ Gas Compression ☐ Electric Generation ☐ Refrigeration ☐ Emergency/Stand by

☒ 4 Stroke Cycle ☐ 2 Stroke Cycle ☐ Carbureted ☐ Spark Ignited ☐ Dual Fuel ☐ Fuel Injected

☐ Diesel ☐ Naturally Aspirated ☐ Blower /Pump Scavenged ☒ Turbo Charged and I.C. ☐ Turbo Charged

☐ Intercooled ☐ I.C. Water Temperature ☒ Lean Burn ☐ Rich Burn

Ignition/Injection Timing: Fixed: Variable: Yes

Manufacture Horsepower Rating: 1340 Proposed Horsepower Rating:

Discharge Parameters

Stack Height (Feet)	Stack Diameter (Feet)	Stack Temperature (°F)	Exit Velocity (FPS)
20	1.0	873	162.61

II. Fuel Data

Type of Fuel: ☒ Field Gas ☐ Landfill Gas ☐ LP Gas ☐ Natural Gas ☐ Digester Gas ☐ Diesel

Fuel Consumption (BTU/bhp-hr): 7405 Heat Value: (HHV) (LHV)

Sulfur Content (grains/100 scf - weight %): 10 ppm

III. Emission Factors (Before Control)

NO_X		CO		SO_2		VOC		Formaldehyde		PM10	
g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv

Source of Emission Factors: ☐ Manufacturer Data ☐ AP-42 ☐ Other (specify):

IV. Emission Factors (Post Control)

NO_X		CO		SO2		VOC		Formaldehyde		PM10	
g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv
2.0		3.0				0.70					

Method of Emission Control: ☐ NSCR Catalyst ☒ Lean Operation ☐ Parameter Adjustment

☐ Stratified Charge ☐ JLCC Catalyst ☒ Other (Specify): SCR Catalyst & Air-fuel Ratio Control

Note: Must submit a copy of any manufacturer control information that demonstrates control efficiency.

Is Formaldehyde included in the VOCs? ☒ Yes ☐ No

V. Federal and State Standards (Check all that apply)

☐ NSPS JJJJ ☒ MACT ZZZZ ☐ NSPS IIII ☐ Title 30 Chapter 117 - List County:

VI. Additional Information

1. Submit a copy of the engine manufacturer's site rating or general rating specification data.
2. Submit a typical fuel gas analysis, including sulfur content and heating value. For gaseous fuels, provide mole percent of constituents.
3. Submit description of air/fuel ratio control system (manufacturer information is acceptable).

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emissions Point Summary

Permit Number:	109919	RN Number:	RN106432263	Date:	May 2013
Company Name:	Burlington Resources Oil & Gas Company LP - DEWITT CENTRAL FACILITY 3				

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table.

AIR CONTAMINANT DATA						EMISSION POINT DISCHARGE PARAMETERS										
1. Emission Point			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate		4. UTM Coordinates of Emission Point			5. Building Height (ft)	6. Height Above Ground (ft)	Source 7. Stack Exit Data			8. Fugitives		
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)	Zone	East (meters)	North (meters)			Diameter (ft) (A)	Velocity (fps) (B)	Temperature (°F) (C)	Length (ft) (A)	Width (ft) (B)	Axis Degrees (C)
Normal Operations																
COMP-01	COMP-01	Compressor Engine 1	CO	8.86	38.81	14	--	--	--	20.0	1	162.61	873	--	--	--
			NOx	5.91	25.89											
			$PM/PM_{10}/PM_{2.5}$	0.10	0.44											
			SO2	0.01	0.04											
			VOC	2.07	9.07											
			Benzene	0.01	0.04											
			CH_2O	0.52	2.28											
FUG	FUG	Site Fugitives	VOC	0.78	3.40	14	--	--	--	3.0	--	--	--	--	--	--
			Benzene	0.01	0.04											
			H_2S	0.001	0.004											
REB-1	REB-1	Glycol Reboiler No. 1	CO	0.04	0.18	14	--	--	--	14.3	--	--	--	--	--	--
			NOx	0.05	0.22											
			$PM/PM_{10}/PM_{2.5}$	0.004	0.02											
			SO_2	0.001	0.004											
			VOC	0.003	0.01											
			Benzene	0.000001	0.000004											
			CH_2O	0.00004	0.0002											
REB-1	DEHY-SV	Glycol Dehy Still Vent	VOC	1.26	5.52	14	--	--	--	14.3	--	--	--	--	--	--
			Benzene	0.05	0.21											
			H_2S	0.01	0.05											
FL-1	TK-01 TK-02	Controlled Condensate Tank Emissions	VOC	2.45	9.07	14	--	--	--	30.0	--	--	--	--	--	--
			Benzene	0.01	0.03											
			H_2S	0.001	0.01											
FL-1	TK-03	Controlled Slop Tank Emissions	VOC	0.22	0.04	14				30.0						
			Benzene	0.002	0.0004											
FL-1	TK-04	Controlled PW Tank Emissions	VOC	0.06	0.24	14	--	--	--	30.0	--	--	--	--	--	--
			Benzene	0.0002	0.001											
			H_2S	0.00004	0.0002											
FL-1	TRUCK1	Controlled Condensate Truck Loading	VOC	1.97	0.95	14	--	--	--	30.0	--	--	--	--	--	--
			Benzene	0.02	0.01											
FL-1	TRUCK2	Controlled Produced Water Truck Loading	VOC	0.02	0.004	14	--	--	--	30.0	--	--	--	--	--	--
			Benzene	0.0001	0.00002											
FL-1	FL-1	Flare Combustion (normal operations waste gas, assist, and pilot)	CO	2.77	9.22	14	--	--	--	30.0	--	--	--	--	--	--
			NO_X	1.38	4.60											
			SO_2	0.23	1.01											
			H_2S	0.001	0.01											
			VOC	0.01	0.04											
			Benzene	0.000003	0.00001											
TK-AF	TK-AF	Antifreeze Liquid Storage	VOC	0.50	0.01	14	--	--	--	--	--	--	--	--	--	--
TK-LO	TK-LO	Lube Oil Liquid Storage	VOC	0.0002	0.000002	14	--	--	--	--	--	--	--	--	--	--
TK-SCAV	TK-SCAV	H2S Scavenger Liquid Storage	VOC	<0.01	<0.01	14	--	--	--	--	--	--	--	--	--	--

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(n) Emissions Point Summary

Permit Number:	109919	RN Number:	RN106432263	Date:	May 2013
Company Name:	Burlington Resources Oil & Gas Company LP - DEWITT CENTRAL FACILITY 3				

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table.

AIR CONTAMINANT DATA						EMISSION POINT DISCHARGE PARAMETERS											
1. Emission Point			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate		4. UTM Coordinates of Emission Point			5. Building Height (ft)	6. Height Above Ground (ft)	Stack Exit Data			Source 8. Fugitives		
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)	Zone	East (meters)	North (meters)			Diameter (ft) (A)	Velocity (fps) (B)	Temperature (°F) (C)	Length (ft) (A)	Width (ft) (B)	Axis Degrees (C)
Scheduled Maintenance Startup and Shutdown Events																	
COMP-01-SV	COMP-01-SV	Compressor Engine 1 Starter Vent	VOC	24.16	0.63	14	--	--	--	20.0	--	--	--	--	--	--
			Benzene	0.16	0.004											
			H_2S	0.06	0.002											
FL-1-SMSS	COMP-01-BD	Compressor Engine 1 Blowdown	VOC	0.57	0.01	14	--	--	--	30.0	--	--	--	--	--	--
			Benzene	0.004	0.0001											
			H_2S	0.001	0.00004											
FL-1-SMSS	FL-1-SMSS	Flare Combustion (Blowdowns waste gas)	CO	0.42	10.96	14	--	--	--	30.0	--	--	--	--	--	--
			NO_X	0.21	5.49											
			SO_2	0.13	0.004											
			H_2S	0.001	0.00004											
TK-01	TK-01	Uncontrolled Condensate Tank Standing Loss Emissions (during flare downtime)	VOC	0.00	0.00	14	--	--	--	25.0	--	--	--	--	--	--
TK-02	TK-02		Benzene	0.00	0.00											
TK-03	TK-03	Uncontrolled Slop Tank Standing Loss Emissions (during flare downtime)	VOC	0.00	0.00	14	--	--	--	25.0	--	--	--	--	--	--
			Benzene	0.00	0.00											
TK-04	TK-04	Uncontrolled PW Tank Standing Loss Emissions (during flare downtime)	VOC	0.001	0.0001	14	--	--	--	25.0	--	--	--	--	--	--
			Benzene	0.00001	0.000001											

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

July 11, 2013

MR RANDY BLACK
MANAGER OF PRODUCTION OPERATIONS GCBU
BURLINGTON RESOURCES OIL & GAS COMPANY LP
600 N DAIRY ASHFORD RD WESTLAKE 3, #15012
HOUSTON TX 77079-

Standard Permit Registration Number: 109919 Renewal Date: July 11, 2023

Location	From the intx of 72 & 119 in Yorktown head N on 119 for 8.9 mi go L on Frank Kozielski Rd then R on Garfield Rd go 1.2 mi keep slight R to stay on George Klein Rd go 0.6 mi site on R
City/County:	Yorktown, DeWitt County
Project Description/Unit:	DeWitt Central Facility 3
Regulated Entity Number:	RN106432263
Customer Reference Number:	CN602989436
New or Existing Site:	New

Oil and Gas Standard Permit (Non-rule) Effective Date: 11/08/2012

Burlington Resources Oil & Gas Company LP has registered the emissions associated with the DeWitt Central Facility 3 under the standard permit listed above as authorized by the Commissioners pursuant to Title 30 Texas Administrative Code § 116.602 (30 TAC § 116.602). Emissions are listed on the attached table. For rule information see www.tceq.texas.gov/permitting/air/nav/standard.html.

Planned MSS emissions for engine blowdown, downstream engine maintenance and flare downtime have been reviewed. These authorized MSS emissions are included on the emissions table. No other planned MSS emissions have been represented or reviewed. The company is also reminded that these facilities may be subject to and must comply with other state and federal air quality requirements.

If you have questions, please contact Mr. Vincent Rehkopf at (512) 239-1361. This action is taken under the authority delegated by the Executive Director of the TCEQ.

Sincerely,

Anne M. Inman, P.E., Manager
Rule Registrations Section
Air Permits Division

cc: Air Section Manager, Region 14 - Corpus Christi

Project Number: 195305

Standard Permit Maximum Emission Rates Table
Standard Permit Number: 109919

The facilities and emissions included in this table have been represented and reviewed as the maximum emissions authorized by this standard permit registration.

MAXIMUM ALLOWABLE EMISSION RATES TABLE (MAERT)														
EPN / Emission Source	**VOC**		**NO_x**		**CO**		**PM_{10} / $PM_{2.5}$**		**SO_2**		**H_2S**		**Benzene**	
	lbs/hr	**tpy**	**lbs/hr**	**tpy**	**lbs/hr**	**tpy**	**lbs/hr**	**tpy**	**lbs/hr**	**tpy**	**lbs/hr**	**tpy**	**lbs/hr**	**tpy**
COMP-01 / Compressor Engine 1	2.07	9.07	5.91	25.89	8.86	38.81	0.10	0.44	0.01	0.04			0.01	0.04
FUG/Site Fugitives	0.78	3.40									<0.01	<0.01	0.01	0.04
REB-1 / Glycol Reboiler No. 1	<0.01	0.01	0.05	0.22	0.04	0.18	<0.01	0.02	<0.01	<0.01			<0.01	<0.01
REB-1 / Glycol Dehy Still Vent	1.26	5.52									0.01	0.05	0.05	0.21
FL-1 / Flare 1 Combustion	4.73	10.34	1.38	4.60	2.77	9.22	<0.01	<0.01	0.23	1.01	<0.01	0.02	0.03	0.04
TK-AF / Antifreeze Liquid Storage	0.50	0.01												
TK-LO / Lube Oil Liquid Storage	<0.01	<0.01												
TK-SCAV / H_2S Scavenger Liquid Storage	<0.01	<0.01												
Scheduled Maintenance, Startup and Shutdown Events														
COMP-01-SV / Compressor Engine 1 Starter Vent	24.16	0.63									0.06	<0.01	0.16	<0.01
FL-1-SMSS / Flare 1 Combustion	0.57	0.01	0.21	5.49	0.42	10.96	<0.01	<0.01	0.13	<0.01	<0.01	<0.01	0.01	<0.01
MSS TK 01 – TK 02 / Uncontrolled Condensate Tank Standing Loss (during flare 1 downtime)	<0.01	<0.01											<0.01	<0.01
MSS TK 03 / Uncontrolled PW Tank Standing Loss (during flare 1 downtime)	<0.01	<0.01											<0.01	<0.01
MSS TK 04 / Uncontrolled Condensate Tank Standing Loss (during flare 2 downtime)	<0.01	<0.01											<0.01	<0.01
TOTAL EMISSIONS (TPY):		**28.99**		**36.20**		**59.17**		**0.46**		**1.06**		**0.08**		**0.34**
MAXIMUM OPERATING SCHEDULE:	**Hours/Day**	24	**Days/Week**	7	**Weeks/Year**	52	**Hours/Year**	8,760						
Notes: Condensate Tank Emissions (TK 01-02), Slop Tank Emission (TK-03), Produced Water Tank Emissions (TK 04), Condensate Truck Loading (TRUCK 1), Produced Water Truck Loading (TRUCK 2), MSS Compressor Engine 1 Blowdown (COMP-01-SV) and MSS Low Pressure Separator (SEP-GAS-1) are routed to the Flare (EPN: FL-1).														

VOC - volatile organic compounds
NO_x - total oxides of nitrogen
CO - carbon monoxide
PM_{10} - particulate matter equal to or less than 10 microns in size
$PM_{2.5}$ - particulate matter equal to or less than 2.5 microns in size
SO_2 - sulfur dioxide
H_2S - hydrogen sulfide

**Fugitive emissions are an estimate only and should not be considered as a maximum allowable

TECHNICAL REVIEW: STANDARD PERMIT FOR INSTALLATION AND/OR MODIFICATION OF OIL AND GAS FACILITIES

Permit No.:	109919	*Company Name:*	Burlington Resources Oil & Gas Company LP	*APD Reviewer:*	Mr. Vincent Rehkopf
Project No.:	195305	*Site/Area Name:*	DeWitt Central Facility 3	*SP No.:*	6002 - NON RULE 2012-NOV-08

GENERAL INFORMATION			
Regulated Entity No.:	RN106432263	**Project Type:**	Standard Permit Application
Customer Reference No.:	CN602989436	**Date Received by TCEQ:**	June 27, 2013
Account No.:	None Assigned	**Date Received by Reviewer:**	July 2, 2013
City/County:	Yorktown, DeWitt County	**Physical Location:**	From the intx of 72 & 119 in Yorktown head N on 119 for 8.9 mi go L on Frank Kozielski Rd then R on Garfield Rd go 1.2 mi keep slight R to stay on George Klein Rd go 0.6 mi site on R

CONTACT INFORMATION					
Responsible Official/Primary Contact Name and Title:	Mr. Randy Black Manager Of Production Operations GCBU	**Phone No.:** **Fax No.:**	(832) 486-6508 (832) 486-6431	**Email:**	randy.c.black@conocophillips.com
Technical Contact/Consultant Name and Title:	Mr. James Woodall Sr. Environmental Specialist	**Phone No.:** **Fax No.:**	(832) 486-6508 (832) 486-6431	**Email:**	james.woodall@conocophillips.com

GENERAL RULES CHECK	YES	NO	COMMENTS
Is confidential information included in the application?		X	
Are there associated NSR or Title V permits at the site?		X	
Are there any registrations or permits that will be incorporated into this standard permit and voided upon issuance of this standard permit?		X	
Is the application for renewal of an existing standard permit?		X	
Was the TCEQ Oil and Gas Emission Calculation Spreadsheet (or equivalent) included in the application?		X	
Was an impacts evaluation included in the application?	X		NO_x, Benzene and H_2S impacts meet standards.
Have all existing affected sources been considered in the scope?	X		
Were appropriate gas and liquid analyses included in the application?	X		
Site-specific gas and liquid analysis used? If representative analysis used provide justification.		X	Representative gas analysis has been provided.
Extended analysis, including benzene?	X		
Is the application certified?	X		

NONATTAINMENT AND PSD CHECK	YES	NO	COMMENTS
Is the site located in a nonattainment area?		X	
Does NO_x Cap and Trade apply to this registration?		X	
Are emissions of any criteria pollutant increasing by 250 tpy at an unnamed source?		X	

MAINTENANCE, STARTUP, AND SHUTDOWN (MSS) EMISSIONS	YES	NO	COMMENTS
Are planned MSS emissions being registered with this authorization? *MSS emissions for all planned MSS activities must be registered for all oil and gas sites beginning January 5, 2014.*	X		Flare downtime and engine blowdown.
Are back-up control/recovery devices in place or do any alternate operations occur during any planned downtime of control/recovery devices, if necessary to meet the limitations of the standard permit?		X	
Have any emissions associated with all planned MSS events/activities been estimated and calculations provided?	X		
Are any engine/compressor start-ups associated with preventative system shutdown activities being authorized as part of normal operation?	X		Engine maintenance events at downstream sites.

TECHNICAL REVIEW: STANDARD PERMIT FOR INSTALLATION AND/OR MODIFICATION OF OIL AND GAS FACILITIES

Permit No.:	109919	***Company Name:***	Burlington Resources Oil & Gas Company LP	***APD Reviewer:***	Mr. Vincent Rehkopf
Project No.:	195305	***Site/Area Name:***	DeWitt Central Facility 3	***SP No.:***	6002 - NON RULE 2012-NOV-08

DESCRIBE OVERALL PROCESS AT THE SITE

Burlington Resources Oil & Gas Company operates the DeWitt Central Facility 3, DeWitt County. The DeWitt Central Facility 3 receives oil, water, and gas from the production sites upstream. Liquids that enter the facility are flashed. Oil, water, and gas pass through on-site separators. High pressure gas is sent to the sales line and low pressure gas is sent to the compression before entering the high pressure line. Fuel gas to the compressor is injected with H_2S scavenger liquid, which will treat the gas H_2S to 10 ppm or less. High pressure gas flows into the site and comingles with the compressor discharge. The combined streams will then be treated in a glycol contractor tower. Liquids are stored in tanks. Oil and water are transported offsite via truck. Captured emissions from tanks and truck loading are routed to the flare.

DESCRIBE PROJECT AND INVOLVED PROCESS

Company has submitted PI-1S and supporting documentation for registration of new site under Standard permit 6000 - Non Rule.

TECHNICAL SUMMARY - DESCRIBE HOW THE PROJECT MEETS THE RULES

§116.610 Applicability
This standard permit includes all facilities at this site and conditions (a)-(d) are met.

§116.611 Registration to Use a Standard Permit
All required documentation has been submitted. All of conditions (a)-(c) are met.

§116.614 Standard Permit Fees
The $850 fee has been submitted.

§116.615 General Conditions
All of general conditions (1)-(10) will be met.

Engines: Emissions are calculated using updated AP-42 condensable and filterable emission factors.
Fugitives: Emissions were calculated using AP-42 emission factors with a VOC weight percentage of 40% and H_2S weight percentage of 0.10%
Tanks: Flash emissions are calculated using the WinSim program. Working/breathing are calculated using AP-42 Ch.7 calculations with data inputs from stream data and throughputs for TK-01 to TK-04. Working and breathing emissions for the Antifreeze and Lube Oil tanks were determined using Tanks 4.0. All emissions from the tanks are routed to the flare control device with a capture and control efficiency of 98%.
Loading: Emissions were calculated using the equation L=12.46*S*P*M/T with the saturation factor of 0.6 and the maximum temperature is 560K for condensate loading and produced water loading.
Flare: Flare emissions were calculated using pilot gas combustion, flare assist gas combustion and waste gas combustion. Their values are 1,292 Btu/SCF and 15 SCF/hr for pilot, 1,292 Btu/SCF and 1,250 SCF/hr for flare assist gas, 2,088 Btu/SCF for the condensate, 2,061 Btu/SCF for the water tanks loading, 1,436 Btu/SCF for the dehy unit waste gas, and 1,448 Btu/SCF for the compressor blowdown event.
Glycol Reboiler: Emissions are calculated using AP-42 emission factors and GLYCALC 4.0.
MSS: Flare will be down for maintenance 2% of the year. During this time, the well would be shut in and therefore gas and liquids would be not producing, but any liquids previously in storage tanks would have standing losses emitted to atmosphere. Engine maintenance events at downstream sites the LP separator gas is sent to the flares and this scenario is conservatively predicted to occur 6% of the year. The engine blowdowns for maintenance or operational adjustments are captured and routed to the flare.

RULE CHECK

REQUIREMENTS	YES, NO, or NA	COMMENTS
What is the distance to the nearest receptor?		Actual distance: 1,500 feet.
If the distance to the nearest receptor is less than 50 feet, are fugitive components used for isolation or safety purposes the only emission sources located one-half the width of any applicable easement?	NA	
Are the total benzene emissions greater than 0.039 lb/hr?	Yes	Total benzene emissions: 0.27 lb/hr
Are the project's maximum predicted concentrations of benzene at the nearest receptor equal to or less than 10% of the appropriate effects screening level (ESL)? Benzene short-term ESL: 170 µg/m³ Benzene long-term ESL: 4.5 µg/m³ *If "NO," an impacts evaluation for benzene must be provided demonstrating that the site meets the protectiveness limits.*	Yes	Short Term Heath Effects: 8.60 lb/hr Long Term Health Effects: 6.69 lb/hr
What is the distance to the nearest property line?		Actual distance: >50 feet.
If the distance to the nearest property line or receptor is less than 50 feet, are fugitive components used for isolation or safety purposes the only emission sources located one-half the width of any applicable easement?	NA	
Are the total H_2S emissions greater than 0.025 lb/hr?	Yes	Total H_2S emissions: 0.08 lb/hr

TECHNICAL REVIEW: STANDARD PERMIT FOR INSTALLATION AND/OR MODIFICATION OF OIL AND GAS FACILITIES

Permit No.:	109919	***Company Name:***	Burlington Resources Oil & Gas Company LP	***APD Reviewer:***	Mr. Vincent Rehkopf
Project No.:	195305	***Site/Area Name:***	DeWitt Central Facility 3	***SP No.:***	6002 - NON RULE 2012-NOV-08

Are the project's maximum predicted concentrations of H_2S at the nearest property line equal to or less than the significant impact level (SIL)? H_2S hourly SAAQS: 108 µg/m3 *If "NO," an impacts evaluation for H_2S must be provided demonstrating that the site meets the protectiveness limits.*	Yes	Short Term Health Effects: 2.50 lb/hr
Are the total SO_2 emissions greater than 2.0 lb/hr?	No	Total SO_2 emissions: 0.37 lb/hr
Are the project's maximum predicted concentrations of SO_2 at the nearest property line equal to or less than the significant level (SIL)? SO_2 hourly SAAQS: 196 µg/m3 *If "NO," an impacts evaluation for SO_2 must be provided demonstrating that the site meets the protectiveness limits.*	NA	
Are the total NO_x emissions greater than 4.0 lb/hr?	Yes	Total NO_x emissions: 7.55 lb/hr
Are the project's maximum predicted concentrations of NOx at the nearest property line equal to or less than the significant impact level (SIL)? NOx hourly SAAQS: 188 µg/m3 *If "NO," an impacts evaluation for NOx must be provided demonstrating that the site meets the protectiveness limits.*	Yes	Short term: 106.84 µg/m3 Long term: 22.95 ug/m3
Are there any engines or turbines located at the site?	Yes	
Do the engines or turbines meet the emission and performance standards listed in Table 6?	Yes	
Are there any liquid fueled engines used for back-up power generation and periodic power? *If "YES," the fuel must have less than or equal to 0.05% sulfur and operate less than 876 hours per rolling 12-month period.*	No	
If the site has access to an electric service, do the engines or turbines meet the technical requirements of the Air Quality Standard Permit for Electric Generating Units (EGU)?	NA	
Are there any open-topped tanks or ponds located at the site?	No	
Is the potential to emit less than or equal to 1 tpy VOC and 0.1 tpy H_2S for the open-topped tanks or ponds?	NA	
Will the site comply with all fugitive requirements listed in the Best Management Practices subsection? *If Leak Detection and Repair (LDAR) alternative fugitive monitoring is required, Table 9 must be met.*	Yes	__X__ < 10 tpy VOC or < 1 tpy H_2S _____ ≥ 10 tpy VOC or ≥ 1 tpy H_2S _____ ≥ 25 tpy VOC or ≥ 5 tpy H_2S LDAR program: NA
Are there any tanks or vessels located at the site?	Yes	
Will all tanks and vessels be of a color that minimizes the effects of solar heating as stated in the rule?	Yes	
When relying on control or recovery devices in emission calculations, will the owner/operator monitor and keep records according to Table 8?	Yes	
Are any of the following units needed to meet the limitations of the rule?	Yes	__X__ process reboilers, heaters, and furnaces (used for control) _____ vapor recovery units _____ thermal oxidation and vapor combustion devices (not including flares)
Will the appropriate level of monitoring be implemented based on any reduction efficiencies claimed?	Yes	
Are there any flares or thermal oxidizers located at the site needed to meet the limitations of the rule?	Yes	The flare will comply with requirements specified in 40 CFR 60.18. There are no thermal oxidizers or vapor combustion control devices at this site.
Is the site in compliance with all other applicable requirements of the standard permit?	Yes	

STATE AND FEDERAL STANDARDS APPLICABILITY		
STANDARDS	YES, NO, or NA	COMMENTS
NSPS Subpart A: General Provisions	NA	

TECHNICAL REVIEW: STANDARD PERMIT FOR INSTALLATION AND/OR MODIFICATION OF OIL AND GAS FACILITIES

Permit No.:	109919	*Company Name:*	Burlington Resources Oil & Gas Company LP	*APD Reviewer:*	Mr. Vincent Rehkopf
Project No.:	195305	*Site/Area Name:*	DeWitt Central Facility 3	*SP No.:*	6002 - NON RULE 2012-NOV-08

NSPS Subpart K, Ka, Kb: Storage Vessels for Petrolcum Liquids	NA	
NSPS Subpart GG: Stationary Gas Turbines	NA	
NSPS Subpart KKK: Equipment Leaks of VOC from Onshore Natural Gas Processing Plants	NA	
NSPS Subpart LLL: Onshore Natural Gas Processing: SO_2	NA	
NSPS Subpart IIII: Stationary Compression Ignition Internal Combustion Engines	NA	
NSPS Subpart JJJJ: Stationary Spark Ignition Internal Combustion Engines	No	Engine manufactured on 9/28/2005.
NSPS Subpart KKKK: Stationary Combustion Turbines	NA	
NESHAP Subpart V: Equipment Leaks (Fugitive Emission Sources)	NA	
MACT Subpart H: Organic HAPs from Equipment Leaks	NA	
MACT Subpart HH: HAPs from Oil and Natural Gas Production Facilities	Yes	Glycol Dehy
MACT Subpart HHH: HAPs from Natural Gas Transmission and Storage Facilities	NA	
MACT Subpart YYYY: HAPs from Stationary Combustion Turbines	NA	
MACT Subpart ZZZZ: HAPs from Stationary Reciprocating Internal Combustion Engines	Yes	
Is the site in compliance with all other applicable rules and regulations?	Yes	

ENGINE

Engine Identifier (EPN / name)	HP	Hrs of Opr/ yr	Fuel Consum. (Btu/hp-hr)	Rich or Lean Burn	2 or 4 stk	Vendor Data Sheet Included?	Emission Factor / Origin of Emission Factor (g/hp-hr or lb/MMBtu)						Type of Control Devices
							VOC (NMNEHC)	NO_x	CO	SO_2	PM_{10} / $PM_{2.5}$	HC HO	
COMP-01 / Compressor Engine 1	1,340	8,760	7,405	Lean	4	Yes	0.70	1.0	2.0	0.000588	0.01941	0.0205	Lean Operation, SCR Catalyst & Air-Fuel Ratio Control

Does NSPS, Subpart JJJJ apply?	No	**Why or why not? If yes, how will requirements be met?**	The COMP-01 / Compressor Engine 1 (lean-burn; 1,340 hp) engine at the site was manufactured on 9/28/2005.
Does MACT, Subpart ZZZZ apply?	Yes	**Why or why not? If yes, how will requirements be met?**	The site is an area source for NESHAP and will meets the HAP emission limits.

SCREEN3 MODELING

Identifier / EPN	Distance to the Property Line (meters)	Max. Hourly Concentration of NO_2/NO_x (from Screen3 modeling) ($\mu g/m^3$)	Max. Annual Concentration of NO_2/NO_x (Max. Hourly Conc. X 0.08) ($\mu g/m^3$)	NO_2/NO_x Ratio (from table below)	Hourly NO_2 Concentration (Max. Hourly Conc. X NO_2/NO_x Ratio) ($\mu g/m^3$)	Annual NO_2 Concentration (Max. Annual Conc. X NO_2/NO_x Ratio) ($\mu g/m^3$)
COMP-01 / Compressor Engine 1	144	45.98	0.3984	0.20	9.20	0.74
REB-1 / Glycol Reboiler No. 1	55	23.39	1.8712	0.75	17.54	1.40
FL-1 / Flare 1 Combustion (Pilot)	102	0.46	0.0368	0.75	0.35	0.03

TECHNICAL REVIEW: STANDARD PERMIT FOR INSTALLATION AND/OR MODIFICATION OF OIL AND GAS FACILITIES

Permit No.:	109919	*Company Name:*	Burlington Resources Oil & Gas Company LP	*APD Reviewer:*	Mr. Vincent Rehkopf
Project No.:	195305	*Site/Area Name:*	DeWitt Central Facility 3	*SP No.:*	6002 - NON RULE 2012-NOV-08

Fl-1 / Flare 1 Combustion (Assist Gas)	200	2.75	0.22	0.75	2.06	0.16
FL-1 / Flare 1 Combustion (Waste Gas Condensate)	218	3.49	0.2792	0.75	2.62	0.21
FL-1 / Flare 1 Combustion (Waste Gas Produced Water)	132	0.94	0.0752	0.75	0.71	0.06
FL-1 / Flare Combustion (normal operations waste gas dehy)	203	3.05	0.244	0.75	2.29	0.18
MSS FL-1 / Flare Combustion (engine blowdown waste gas)	208	2.76	0.2208	0.75	2.07	0.18
				Background Concentration DeWitt County =	70	20
				TOTAL =	106.84	22.95
				Is total limit below the annual NAAQS limit for NO_2 of 100 µg/m³ (yes/no)?	--	Yes
				Is the total limit below the hourly NAAQS limit for NO_2 of 188 ug/m3 (yes/no)?	Yes	--

Unless otherwise documented by actual test data, the following nitrogen dioxide (NO_2)/NO_x ratios shall be used for modeling NO_2:

Device	NO_x Emission Rate (g/hp-hr)	NO_2/NO_x Ratio
IC Engine	Less than 2.0	0.4
IC Engine	2.0 thru 10.0	0.15 + (0.5/Q)
IC Engine	Greater than 10.0	0.2
Turbines		0.25
IC Engine with catalytic converter		0.85

Q = NOx emission rate (g/hp-hr)

MAXIMUM ALLOWABLE EMISSION RATES TABLE (MAERT)

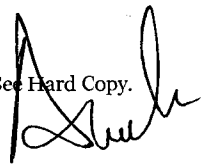
EPN / Emission Source	VOC		NO_x		CO		PM_{10} / $PM_{2.5}$		SO_2		H_2S		Benzene	
	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy
COMP-01 / Compressor Engine 1	2.07	9.07	5.91	25.89	8.86	38.81	0.10	0.44	0.01	0.04			0.01	0.04
FUG/Site Fugitives	0.78	3.40									<0.01	<0.01	0.01	0.04
REB-1 / Glycol Reboiler No. 1	<0.01	0.01	0.05	0.22	0.04	0.18	<0.01	0.02	<0.01	<0.01			<0.01	<0.01
REB-1 / Glycol Dehy Still Vent	1.26	5.52									0.01	0.05	0.05	0.21
FL-1 / Flare 1 Combustion	4.73	10.34	1.38	4.60	2.77	9.22	<0.01	<0.01	0.23	1.01	<0.01	0.02	0.03	0.04
TK-AF / Antifreeze Liquid Storage	0.50	0.01												
TK-LO / Lube Oil Liquid Storage	<0.01	<0.01												
TK-SCAV / H_2S Scavenger Liquid Storage	<0.01	<0.01												
Scheduled Maintenance, Startup and Shutdown Events														
COMP-01-SV / Compressor Engine 1 Starter Vent	24.16	0.63									0.06	<0.01	0.16	<0.01
FL-1-SMSS / Flare 1 Combustion	0.57	0.01	0.21	5.49	0.42	10.96	<0.01	<0.01	0.13	<0.01	<0.01	<0.01	0.01	<0.01
MSS TK 01 – TK 02 / Uncontrolled Condensate Tank Standing Loss (during flare 1 downtime)	<0.01	<0.01											<0.01	<0.01
MSS TK 03 / Uncontrolled PW Tank Standing Loss (during flare 1 downtime)	<0.01	<0.01											<0.01	<0.01
MSS TK 04 / Uncontrolled Condensate Tank Standing Loss (during flare 2 downtime)	<0.01	<0.01											<0.01	<0.01

TECHNICAL REVIEW: STANDARD PERMIT FOR INSTALLATION AND/OR MODIFICATION OF OIL AND GAS FACILITIES

Permit No.:	109919	***Company Name:***	Burlington Resources Oil & Gas Company LP	***APD Reviewer:***	Mr. Vincent Rehkopf
Project No.:	195305	***Site/Area Name:***	DeWitt Central Facility 3	***SP No.:***	6002 - NON RULE 2012-NOV-08

TOTAL EMISSIONS (TPY):		**28.99**		**36.20**		**59.17**		**0.46**		**1.06**		**0.08**		**0.34**
MAXIMUM OPERATING SCHEDULE:	**Hours/Day**	24	**Days/Week**	7	**Weeks/Year**	52	**Hours/Year**	8,760						

Notes: Condensate Tank Emissions (TK 01-02), Slop Tank Emission (TK-03), Produced Water Tank Emissions (TK 04), Condensate Truck Loading (TRUCK 1), Produced Water Truck Loading (TRUCK 2), MSS Compressor Engine 1 Blowdown (COMP-01-SV) and MSS Low Pressure Separator (SEP-GAS-1) are routed to the Flare (EPN: FL-1).

	TECHNICAL REVIEWER	PEER REVIEWER	FINAL REVIEWER
SIGNATURE:			See Hard Copy. 
PRINTED NAME:	Mr. Vincent Rehkopf	Ms. Sally Bittick	Ms. Anne Inman, P.E., Manager
DATE:	July 11, 2013	July 11, 2013	July 11, 2013

BASIS OF PROJECT POINTS	POINTS
Base Points:	2.50
Project Complexity Description and Points:	
Complete in <14 days	1.00
NO_2 NAAQS Screen3	1.00
An Additional Table	0.25
Technical Reviewer Project Points Assessment:	4.75
Final Reviewer Project Points Confirmation:	

EWSR

07/11/2013 ----------NSR IMS - PROJECT RECORD ----------

PROJECT#: 195305 PERMIT#: 109919 STATUS: PENDING DISP CODE: C

RECEIVED: 06/27/2013 PROJTYPE: INITIAL AUTHTYPE: STDPMT ISSUED DT: 7/11/13

RENEWAL: 7/11/23

PROJECT ADMIN NAME: OIL AND GAS FACILITY

PROJECT TECH NAME: DEWITT CENTRAL FACILITY 3

4.75 Sally

Assigned Team:RULE REG SECTION

STAFF ASSIGNED TO PROJECT:

MONROE , SHEILA	- REVIEWR1_2 -	AP INITIAL REVIEW
REHKOPF , VINCENT	- REVIEW ENG -	RR TEAM

CUSTOMER INFORMATION (OWNER/OPERATOR DATA)

ISSUED TO: BURLINGTON RESOURCES OIL & GAS COMPANY LP

COMPANY NAME: Burlington Resources Oil & Gas Company LP

CUSTOMER REFERENCE NUMBER: **CN602989436**

REGULATED ENTITY/SITE INFORMATION

REGULATED ENTITY NUMBER: **RN106432263** ACCOUNT:

PERMIT NAME: DEWITT CENTRAL FACILITY 3

REGULATED ENTITY LOCATION: FR THE INTX OF 72 & 119 IN YORKTOWN HEAD N ON 119 FOR 8.9 MI GO L ON FRANK KOZIELSKI RD THEN R ON GARFIELD RD GO 1.2 MI KEEP SLIGHT R TO STAY ON GEORGE KLEIN RD GO 0.6 MI SITE ON R

REGION 14 - CORPUS CHRISTI NEAR CITY: YORKTOWN COUNTY: DEWITT

CONTACT DATA

CONTACT NAME: MR RANDY BLACK CONTACT ROLE: RESPONSIBLE OFFICIAL

JOB TITLE: MANAGER OF PRODUCTION OPERATIONS GCBU ORGANIZATION: BURLINGTON RESOURCES OIL & GAS COMPANY LP

MAILING ADDRESS: 600 N DAIRY ASHFORD RD, WESTLAKE 3, #15012, HOUSTON, TX, 77079-1100

PHONE: (832) 486-6508 Ext: 0

FAX: (832) 486-6431 Ext: 0

EMAIL:RANDY.C.BLACK@CONOCOPHILLIPS.COM

CONTACT NAME: MR JAMES WOODALL CONTACT ROLE: TECHNICAL CONTACT

JOB TITLE: SR ENVIRONMENTAL SPECIALIST ORGANIZATION: BURLINGTON RESOURCES OIL & GAS COMPANY LP

MAILING ADDRESS: 600 N DAIRY ASHFORD RD, WESTLAKE 3, #15012, HOUSTON, TX, 77079-1100

PHONE: (832) 486-6508 Ext: 0

FAX: (832) 486-6431 Ext: 0

EMAIL:JAMES.WOODALL@CONOCOPHILLIPS.COM

PROJECT NOTES:

06/28/2013 DFC 6/28/2013

PERMIT NOTES:

FEE:

Reference	Fee Receipt Number	Amount	Fee Receipt Date	Fee Payment Type
25302		850.00		CHECK

TRACKING ELEMENTS:

TE Name	Start Date	Complete Date
APIRT RECEIVED PROJECT (DATE)	06/27/2013	
APIRT TRANSFERRED PROJECT TO TECHNICAL STAFF (DATE)	06/28/2013	
CENTRAL REGISTRY UPDATED	06/28/2013	06/28/2013
PROJECT RECEIVED BY ENGINEER (DATE)	07/02/2013	
ENGINEER INITIAL REVIEW COMPLETED (DATE)	07/11/2013	
PEER / MANAGER REVIEW PERIOD	07/11/2013	07/11/2013

UNIT TYPES:

Project Unit Type:

Industry Group	Industry Type	Source Type	Control/BACT Type	Request	Authorization
CHEMICAL	OIL AND GAS				

PROJECT RULES:

Unit Desc	Rule Desc	Request Type	On Application	Approve
OIL AND GAS PRODUCTION FACILITIES	6002 - NON RULE 2012-NOV -08 -	ADD	Y	APPROVE

PERMIT RULES:

Unit Desc	Rule Desc	Start Date	End Date

PROJECT ATTRIBUTES:

Attributes	Value
MSS- 101.222(H)(1) PROJECT POINT	E

Oil and Gas Initial Screening Sheet

Reviewers Name: Vincent Rehkopf **Scan to WL/TL BY:** 7/16/17

Company: Burlington Resources	Permit No.: 109919	Project No.: 195305
☒ Initial ☐ Revision ☐ Renewal ☐ Response to Deficiency		Date Reviewer Assigned to Project: 7/2/13 Deadline for Contact w/ company: — Actual Date Company was Contacted: 7/11/13

Certified? ☒ Yes ☐ No ☒ Process/Project Description ☐ Rule description (checklists or equivalent)
☐ Emission Summary (Table 1a)
VOC tpy: 28.99 NOx tpy: 36.20 CO tpy: 59.17 SO_2 tpy: 1.06 H_2S tpy: 0.08

☐ For non-Barnett Shale SP: 106.261/106.262 speciation of all project emissions (excluding engines/turbines)
Comments: _____

☒ Lab Analysis
☐ Actual site ☒ Representative ☒ Included justification for representative analysis
☐ Sweet ☒ Sour ☒ Analysis tested for H_2S ☒ >1/4 mile to receptor (non-BSh PBR) Minimum vent height met? ☒ Yes ☐ No
☒ Gas ☒ Liquids ☒ Flash Gas Notes: _____
Comments: _____

☒ Tank Emissions
☒ Condensate ☐ Crude oil ☒ Produced water ☐ Other liquids: _____
☒ TANKS 4.0 ☐ E&P Tanks ☐ Other method: _____
☐ Flash: WinSim
☒ Emissions are controlled by: Flare
Comments: _____

☒ Truck Loading
☒ Condensate ☐ Crude oil ☒ Produced water
☒ 12.46 x SPM/T ☐ Other method: _____
☒ Emissions controlled by: Flare ☒ Collection efficiency: 98 % ☒ Control efficiency: 98.7%
Comments: NSPS XX

☒ Compressor Engines/Turbines
☒ Manufacturer spec. sheets or equivalent ☒ If controlled, control spec. sheets or equiv. ☒ modeling for NO_2 NAAQS
Meet NSPS JJJ ☐ Yes ☐ No ☒ NA ☒ MACT ZZZZ ☐ property line distance or stack height method
Comments: _____

☒ Fugitives
☒ Gas ☒ Liquids ☒ used TCEQ emission factors
Comments: _____

☒ Glycol Units
☒ GRI-GLYCalc ☒ Extended analysis and prior to glycol inlet? ☒ Yes ☐ No
Comments: _____

☒ Control Devices
☒ Flare ☐ Combustor ☐ Thermal Oxidizer ☐ VRU
☒ NSPS 60.18 XX Alternate operating scenario included? ☐ Yes ☐ No
Control efficiency_____ % If over baseline efficiency, description/justification provided? ☐ Yes ☐ No
Comments: _____

☒ MSS (optional until January 5, 2014)
☒ Description of activity, duration, and frequency
Comments: flare down, engine blowdown

Date 3/30/2012

Texas Commission on Environmental Quality
Form PI-1S
Registrations for Air Standard Permit
(Page 1)

I. Registrant Information		
A. Is a TCEQ Core Data Form (TCEQ Form No. 10400) attached? Core Data Form required for Standard Permits 6004, 6006, 6007, 6008, and 6013.		☒ YES ☐ NO
Customer Reference Number (CN): CN602989436		
Regulated Entity Number (RN): RN106432263		
B. Company or Other Legal Customer Name (must be same as Core Data "Customer"): Burlington Resources Oil & Gas Company LP		
Company Official Contact Name: Randy Black		
Title: Manager of Production Operations - GCBU		
Mailing Address: 600 N Dairy Ashford, Westlake 3, #15012		
City: Houston	State: TX	ZIP Code: 77079
Phone No.: 832-486-6508	Fax No.: 832-486-6431	E-mail Address: randy.c.black@conocophillips.com
C. Technical Contact Name: James Woodall		
Title and Company: Sr. Environmental Specialist		
Mailing Address: 600 N Dairy Ashford, Westlake 3, #15012		
City: Houston	State: TX	ZIP Code: 77079
Phone No.: 832-486-6508	Fax No.: 832-486-6431	E-mail Address: james.woodall@conocophillips.com
D. Facility Location Information (Street Address):		
If no street address, provide clear driving directions to the site in writing:		
From the intersection of TX-72 and TX-119 in Yorktown, head north on TX-119 and travel 8.9 miles. Turn left on Frank Kozielski Rd and then right on Garfield Road continue 1.2 miles. Keep a slight right to continue on George Klein Road for 0.6 miles. Site entrance will be on right.		
City: Yorktown	County: DeWitt	ZIP Code: 78164
Latitude (nearest second): 29°02'59.24"	Longitude (nearest second): 97°39'51.53"	
II. Facility and Site Information		
A. Name and Type of Facility: DeWitt Central Facility 3		☒ Permanent ☐ Temporary
B. Type of Action:		
☒ Initial Application	☐ Renewal	☐ Change to Registration
☒ Registration No.: 109919	☐ Expiration Date:	
C. List the Standard Permit Claimed: 6002		
Description: Oil and Gas Facilities		

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APIRT
109919

Texas Commission on Environmental Quality
Registrations for Air Standard Permit
PI-1S
(Page 2)

II. Facility and Site Information *(continued)*	
D. Concrete Batch Plant Standard Permit *(Check one)* ☐ Central Mix ☐ Ready Mix ☐ Specialty Mix ☐ Enhanced Controls for Concrete Batch Plants	
E. Proposed Start of Construction:	Length of Time at the Site:
F. Is there a previous Standard Exemption or Permit by Rule for the facilities in this registration? *(Attach details regarding changes)*	☒ YES ☐ NO
If "YES," list Permit No.: 103471	
G. Are there any other facilities at this site which are authorized by an air Standard Permit?	☐ YES ☒ NO
If "YES," list Permit No.:	
H. Are there any other air preconstruction permits at this site?	☐ YES ☒ NO
If "YES," list Permit No.:	
Are there any other air preconstruction permits at this site that would be directly associated with this project?	☐ YES ☒ NO
If "YES," list Permit No.:	
I. TCEQ Account Identification Number (if known):	
J. Is this facility located at a site which is required to obtain a federal operating permit pursuant to 30 TAC Chapter 122?	☐ YES ☒ NO ☐ To Be Determined
K. Identify the requirements of 30 TAC Chapter 122 that will be triggered if this Form PI-1S application is approved. ☐ Application for an FOP ☐ FOP Significant Revision ☐ FOP Minor ☐ Operational Flexibility/Off-Permit Notification ☐ Streamlined Revision for GOP ☐ To Be Determined ☒ None	
L. Identify the type(s) issued and/or FOP application(s) submitted/pending for the site. *(check all that apply)* ☐ SOP ☐ GOP ☐ GOP Application/Revision Application: Submitted or Under APD Review ☐ SOP Application Review Application: Submitted or Under APD Review ☒ N/A	

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Texas Commission on Environmental Quality
Registrations for Air Standard Permit
PI-1S
(Page 3)

III. Fee Information			
A. Is a copy of the check or money order attached?			☒ YES ☐ NO
Check/Money Order/Transaction Number:			
Company name on Check: TITAN Engineering, Inc.			
Fee Amount: $850.00			
IV. Public Notice *(If Applicable)*			
A. Is the plant located at a site contiguous or adjacent to the public works project?			☐ YES ☐ NO
B. Name of Public Place:			
Physical Address:			
City:		County:	
C. Small Business Classification:			☐ YES ☐ NO
D. Concrete batch plants with enhanced controls, permanent rock crushers, and animal carcass incinerators shall place a copy of the technically complete application at the appropriate TCEQ regional office only.			
E. Please furnish the names of the state legislators who represent the area where the facility site is located:			
State Senator:			
State Representative:			
F. For Concrete Batch Plants, name of the County Judge for this facility site:			
County Judge:			
Mailing Address:			
City:	State:	ZIP Code:	
G. For Concrete Batch Plants, is the facility located in a municipality and/or extraterritorial jurisdiction of a municipality?			☐ YES ☐ NO
If "YES," list the name(s) of the Presiding Officer(s) for the municipality and/or extraterritorial jurisdiction:			
Presiding Officer(s):			
Title:			
Mailing Address:			
City:	State:	ZIP Code:	

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Registration for Air Standard Permit
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V.	**Technical Information Including State and Federal Regulatory Requirements Registrants must be in compliance with all applicable state and federal regulations and standards to claim a Standard Permit.**	
A.	Is confidential information submitted and properly marked with this registration?	☐ YES ☒ NO
B.	Is a process flow diagram and a process description attached?	☒ YES ☐ NO
C.	Is a plot plan attached?	☒ YES ☐ NO
D.	Are emissions data and calculations for this claim attached?	☒ YES ☐ NO
E.	Is information attached showing how the general requirements and applicability (30 TAC 116.610 and 116.615) are met?	☒ YES ☐ NO
F.	Is information attached showing how the specific requirements are met?	☒ YES ☐ NO

VI. Delinquent Fees and Penalties

This form **will not be processed** until all delinquent fees and/or penalties owed to the TCEQ or the Office of the Attorney General on behalf of the TCEQ is paid in accordance with the Delinquent Fee and Penalty Protocol. For more information regarding Delinquent Fees and Penalties, go to the TCEQ Web site at: www.tceq.texas.gov/agency/delin/index.html.

VII. Signature Requirements

The signature below indicates that I have knowledge of the facts herein set forth and that the same are true and correct to the best of my knowledge and belief. I further state that to the best of my knowledge and belief, the project for which application is made will not in any way violate any provision of the Texas Water Code (TWC), Chapter 7, Texas Clean Air Act (TCAA), as amended, or any of the air quality rules and regulations of the Texas Commission on Environmental Quality or any local governmental ordinance or resolution enacted pursuant to the TCAA. I further state that I have read and understand TWC 7.177 and 7.183, which defines ***Criminal Offenses*** for certain violations, including intentionally or knowingly making or causing to be made false material statements or representations in this application, and TWC 7.187, pertaining to ***Criminal Penalties***.

Name: RANDY BLACK
Print Full Name

Signature: _____
Original Signature Required

Date: 6/16/13

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TCEQ Use Only

TCEQ Core Data Form

For detailed instructions regarding completion of this form, please read the Core Data Form Instructions or call 512-239-5175.

SECTION I: General Information

1. Reason for Submission *(If other is checked please describe in space provided)*

☑ New Permit, Registration or Authorization *(Core Data Form should be submitted with the program application)*

☐ Renewal *(Core Data Form should be submitted with the renewal form)* ☐ Other

2. Attachments **Describe Any Attachments:** *(ex. Title V Application, Waste Transporter Application, etc.)*

☑ Yes ☐ No — Standard Permit Registration

3. Customer Reference Number *(if issued)*	Follow this link to search for CN or RN numbers in Central Registry**	4. Regulated Entity Reference Number *(if issued)*
CN 602989436		RN RN106432263

SECTION II: Customer Information

AIR PERMITS DIVISION

5. Effective Date for Customer Information Updates (mm/dd/yyyy)

JUN 27 2013

RECEIVED

6. Customer Role (Proposed or Actual) – *as it relates to the Regulated Entity listed on this form. Please check only one of the following:*

☐ Owner ☐ Operator ☑ Owner & Operator
☐ Occupational Licensee ☐ Responsible Party ☐ Voluntary Cleanup Applicant ☐ Other:

7. General Customer Information

☐ New Customer ☐ Update to Customer Information ☐ Change in Regulated Entity Ownership
☐ Change in Legal Name (Verifiable with the Texas Secretary of State) ☑ No Change**

If "No Change" and Section I is complete, skip to Section III – Regulated Entity Information.

8. Type of Customer:	☐ Corporation	☐ Individual	☐ Sole Proprietorship- D.B.A
☐ City Government	☐ County Government	☐ Federal Government	☐ State Government
☐ Other Government	☐ General Partnership	☐ Limited Partnership	☐ Other:

9. Customer Legal Name *(If an individual, print last name first: ex: Doe, John)* — *If new Customer, enter previous Customer below* — *End Date:*

10. Mailing Address:

City	State	ZIP	ZIP + 4

11. Country Mailing Information *(if outside USA)*

12. E-Mail Address *(if applicable)*

13. Telephone Number **14. Extension or Code** **15. Fax Number** *(if applicable)*

16. Federal Tax ID *(9 digits)* **17. TX State Franchise Tax ID** *(11 digits)* **18. DUNS Number** *(if applicable)* **19. TX SOS Filing Number** *(if applicable)*

20. Number of Employees

☐ 0-20 ☐ 21-100 ☐ 101-250 ☐ 251-500 ☐ 501 and higher

21. Independently Owned and Operated?

☐ Yes ☐ No

SECTION III: Regulated Entity Information

22. General Regulated Entity Information *(If 'New Regulated Entity" is selected below this form should be accompanied by a permit application)*

☐ New Regulated Entity ☐ Update to Regulated Entity Name ☑ Update to Regulated Entity Information ☐ No Change** *(See below)*

**If "NO CHANGE" is checked and Section I is complete, skip to Section IV, Preparer Information.

23. Regulated Entity Name *(name of the site where the regulated action is taking place)*

DeWitt Central Facility 3

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24. Street Address of the Regulated Entity: *(No P.O. Boxes)*							
	City		**State**		**ZIP**		**ZIP + 4**
25. Mailing Address:	600 N Dairy Ashford						
	Westlake 3, #15012						
	City	Houston	**State**	TX	**ZIP**	77079	**ZIP + 4**

26. E-Mail Address:	james.woodall@conocophillips.com	
27. Telephone Number	**28. Extension or Code**	**29. Fax Number** *(if applicable)*
(832) 486-6508		832-486-6431

30. Primary SIC Code (4 digits)	**31. Secondary SIC Code** (4 digits)	**32. Primary NAICS Code** (5 or 6 digits)	**33. Secondary NAICS Code** (5 or 6 digits)
1311		211111	

34. What is the Primary Business of this entity? *(Please do not repeat the SIC or NAICS description.)*

Natural Gas Production

Questions 34 – 37 address geographic location. Please refer to the instructions for applicability.

35. Description to Physical Location:	From the intersection of TX-72 and TX-119 in Yorktown, head north on TX-119 and travel 8.9 miles. Turn left on Frank Kozielski Rd and then right on Garfield Road continue 1.2 miles. Keep a slight right to continue on George Klein Road for 0.6 miles. Site entrance will be on right.

36. Nearest City	**County**	**State**	**Nearest ZIP Code**
Yorktown	DeWitt	TX	78164

37. Latitude (N) In Decimal:			**38. Longitude (W) In Decimal:**		
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
29	2	59.24	97	39	51.53

39. TCEQ Programs and ID Numbers Check all Programs and write in the permits/registration numbers that will be affected by the updates submitted on this form or the updates may not be made. If your Program is not listed, check other and write it in. See the Core Data Form instructions for additional guidance.

☐ Dam Safety	☐ Districts	☐ Edwards Aquifer	☐ Industrial Hazardous Waste	☐ Municipal Solid Waste
☑ New Source Review – Air	☐ OSSF	☐ Petroleum Storage Tank	☐ PWS	☐ Sludge
☐ Stormwater	☐ Title V – Air	☐ Tires	☐ Used Oil	☐ Utilities
☐ Voluntary Cleanup	☐ Waste Water	☐ Wastewater Agriculture	☐ Water Rights	☐ Other:

SECTION IV: Preparer Information

40. Name:	James Woodall	**41. Title:**	Sr. Environmental Specialist

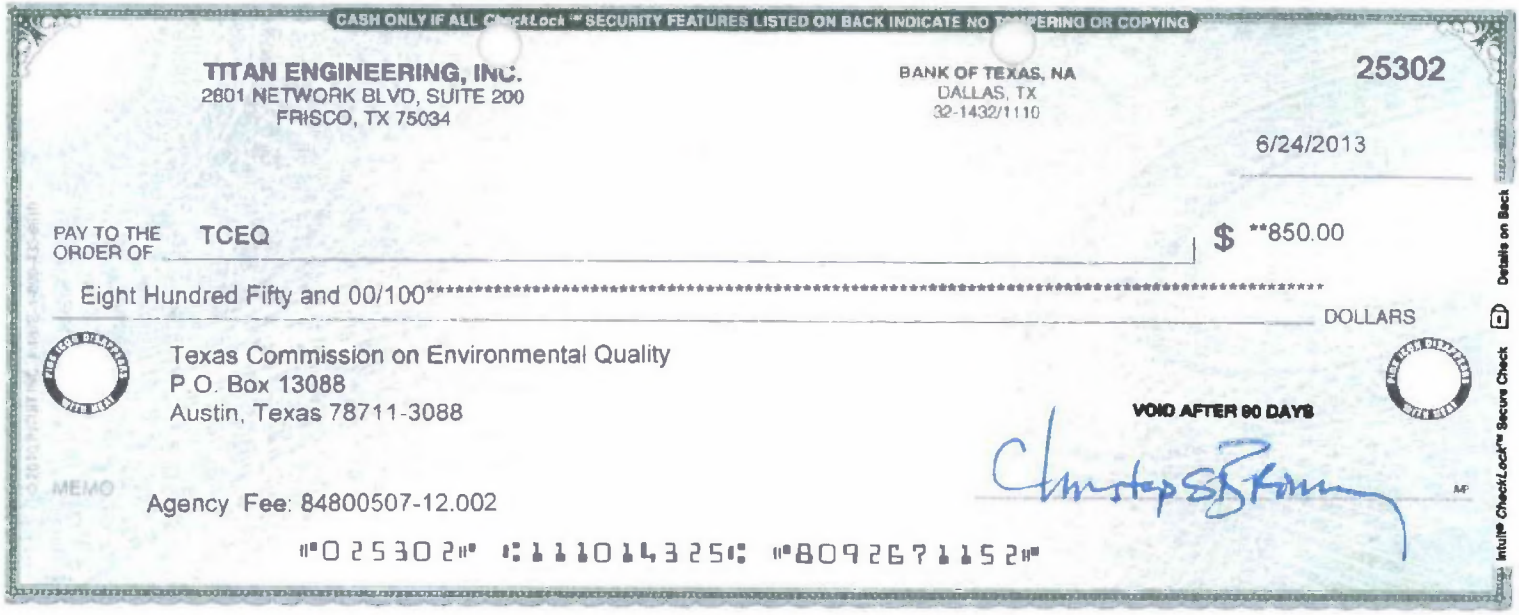
42. Telephone Number	**43. Ext./Code**	**44. Fax Number**	**45. E-Mail Address**
(832) 486-6508	N/A		james.woodall@conocophillips.com

SECTION V: Authorized Signature

46. By my signature below, I certify, to the best of my knowledge, that the information provided in this form is true and complete, and that I have signature authority to submit this form on behalf of the entity specified in Section II, Field 9 and/or as required for the updates to the ID numbers identified in field 39.

(See the Core Data Form instructions for more information on who should sign this form.)

Company:	Burlington Resources Oil & Gas Company LP	**Job Title:**	Manager of Production Operations- GCBU		
Name *(In Print)*:	Randy Black			**Phone:**	(832) 486-6508
Signature:		JUN 27 2013 APIRT		**Date:**	6/16/13


CASH ONLY IF ALL CheckLock™ SECURITY FEATURES LISTED ON BACK INDICATE NO TAMPERING OR COPYING

TITAN ENGINEERING, INC.
2801 NETWORK BLVD, SUITE 200
FRISCO, TX 75034

BANK OF TEXAS, NA
DALLAS, TX
32-1432/1110

25302

6/24/2013

PAY TO THE ORDER OF TCEQ $ **850.00

Eight Hundred Fifty and 00/100********** DOLLARS

Texas Commission on Environmental Quality
P O. Box 13088
Austin, Texas 78711-3088

VOID AFTER 90 DAYS

MEMO Agency Fee: 84800507-12.002

⑈025302⑈ ⑆111014325⑆ ⑈8092671152⑈

Details on Back. Intuit® CheckLock™ Secure Check

TITAN ENGINEERING, INC. 25302

TCEQ 6/24/2013

Date	Type	Reference	Original Amt.	Balance Due	Discount	Payment
6/24/2013	Bill	84800507-12.002	850.00	850.00		850.00
					Check Amount	850.00

AIR PERMITS DIVISION
JUN 2 7 2013
RECEIVED

Bank of Texas Operati Agency Fee: 84800507-12.002 850.00

JUN 2 7 2013
APIRT

TITAN Engineering, Inc.
Environmental Consulting and Management

June 24, 2013

Air Permits Initial Review Team (APIRT) Section, MC 161
Texas Commission on Environmental Quality
12100 Park 35 Circle, Building C, Third Floor
Austin, Texas 78753

via FedEx

Subject: Oil and Gas Standard Permit Registration
Burlington Resources Oil & Gas Company LP
DeWitt Central Facility 3
DeWitt County, Texas
CN602989436, RN106432263

Dear Mr. Johnny Bowers:

On behalf of Burlington Resources Oil & Gas Company LP (Burlington), TITAN Engineering, Inc. (TITAN) is submitting this Oil and Gas Standard Permit (SP) Registration to the Texas Commission on Environmental Quality (TCEQ) for operations at DeWitt Central Facility 3 (the Site) located near Yorktown in DeWitt County, TX. Upon authorization, this standard permit will authorize the following project:

- One (1) compressor engine and associated starter vent and blowdown;
- One (1) glycol dehydration unit;
- Two (2) controlled atmospheric condensate storage tanks and associated loading;
- One (1) controlled atmospheric produced water storage tank and associated loading;
- One (1) controlled atmospheric slop storage tank and associated loading;
- One (1) flare combustion control device; and,
- Piping and fugitive components.

TITAN and Burlington Resources believe that the Site and its associated air emissions meet the requirements of the TCEQ Non-Rule Standard Permit for Oil and Gas Handling and Production Facilities and 30 TAC §116.610, §116.611, §116.614, and §116.615. A PBR Registration (Permit number 103471) was submitted for this site. With the modifications made to the site indicated in this submittal, it was later determined that a different level of authorization was required. An initial notification for a New Project was submitted to the TCEQ via the STEERs ePermitting system on May 6, 2013.

This Standard Permit Registration has been prepared in accordance with TCEQ guidance and includes the following attachments:

- Attachment 1 presents a process description, area map, receptor map, process flow diagram, and plot plan;
- Attachment 2 contains the applicable TCEQ forms and tables;
- Attachment 3 presents emission rate calculations;
- Attachment 4 describes how the Site qualifies for Standard Permit;
- Attachment 5 includes an impacts evaluation; and
- Attachment 6 includes supporting documentation.

TITAN and Burlington would like to collectively thank you in advance for your review and concurrence with this Oil and Gas Standard Permit Registration. If you have any questions regarding the information presented in this letter and attachments, please do not hesitate to contact Mr. James Woodall at 832-486-6508 or james.woodall@conocophillips.com or me at 469-365-1168 or cchermak@titanengineering.com.

Sincerely,
TITAN Engineering, Inc.

Christina Chermak
Project Manager

Attachments

cc: Ms. Rosario Torres, TCEQ Region 14 – Corpus Christi
Mr. James Woodall, Sr. Environmental Specialist, ConocoPhillips Company
TCEQ Revenue Section, MC-214, Bldg. A, Third Floor, Austin, Texas 78753 (Form PI-1S, CORE Data form, and fee only)

OIL AND GAS STANDARD PERMIT REGISTRATION

CN602989436
RN106432263

Burlington Resources Oil & Gas Company LP
DeWitt Central Facility 3
DeWitt County, Texas

Project No. 84800507-12.002

May 2013

ATTACHMENT 1
PROCESS/PROJECT DESCRIPTION

OIL AND GAS STANDARD PERMIT REGISTRATION

DEWITT CENTRAL FACILITY 3

BURLINGTON RESOURCES OIL & GAS COMPANY LP

ATTACHMENT 1
PROCESS/PROJECT DESCRIPTION

This Standard Permit registration is being submitted to authorize one (1) compressor engine and associated blowdown and starter vent event, two (2) controlled atmospheric condensate storage tanks and associated loading, one (1) controlled atmospheric produced water storage tank and associated loading, one (1) controlled atmospheric slop storage tank and associated loading, one (1) flare combustion control device, and piping and fugitive components (the Project) at the DeWitt Central Facility 3 (the Site) located in DeWitt County, Texas. Figure 1-1 is an area map showing the location of the Site and the surrounding area and Figure 1-2 is a map demonstrating the nearest receptor. Figure 1-3 is a process flow diagram for the Site and Figure 1-4 is a plot-plan of the site demonstrating the location of various equipment components.

Normal Operations

The Site will receive High Pressure (HP) gas, Low Pressure (LP) gas, and liquids (condensate and water) from the production sites upstream. The gas off the HP and LP separators at the wellsites will be metered and enter into their respective HP and LP headers and pipelines. LP gas will flow through the LP scrubber and be sent through compression (Facility Identification Numbers [FINs] COMP-01) before entering the HP line. Fuel gas to the compressor is injected with H_2S scavenger liquid, which will treat the gas H_2S to 10 ppm or less. HP gas flows into the Site and comingles with the compressor discharge. The combined streams will then be treated in a glycol contactor tower. The treated gas is then metered and sent to sales.

The tri-ethylene glycol used in the contactor tower is part of a regenerative system. The rich glycol is first routed through a flash tank which collects off gas and routes it to the burner (FIN REB-1) for combustion. The rich glycol is sent through the regeneration unit where it is heated and the water is removed, and then re-sent to the contactor tower as lean glycol. Emissions from the dehy regenerator still vent (FIN DEHY-SV) are controlled by the BTEX condenser and routed to reboiler, which will be running continuously with a 98% combustion efficiency. In the event that the reboiler cannot handle the total volume of recycled gas to it, the remainder will be re-directed to flare (FIN FL-1) with a 98% combustion efficiency.

Pressurized liquids will be measured at the single well facilities and flow through a free water knockout separator at the Site before they enter the condensate pipeline. The water is routed to the produced water tank (FIN TK-04). The free liquids from the compressor scrubbers, fuel gas scrubber, and slug catcher will go to the slop tank (FIN TK-03). Emissions from the condensate tanks (FINs TK-01 and TK-02), slop tank (FIN TK-03), and the produced water tank (FIN TK-04) will be routed to the flare (FIN FL-1) and combusted at a 98% destruction efficiency. As demonstrated in the calculations, assist gas is sent to the flare to ensure that the waste gas stream can sustain combustion. Flash off gas from the water knockout separator is recirculated to the compressor, and condensate continues to the condensate pipeline for sales.

All tanks are loaded out periodically by truck (FINs TRUCK1 and TRUCK2). Vapors from the loading process are routed to the flare (FIN FL-1) for combustion as well. The Site will also emit emissions due to equipment component leaks (FIN FUG) and small storage tanks for engine operation (FINs TK-AF, TK-LO, and TK-SCAV).

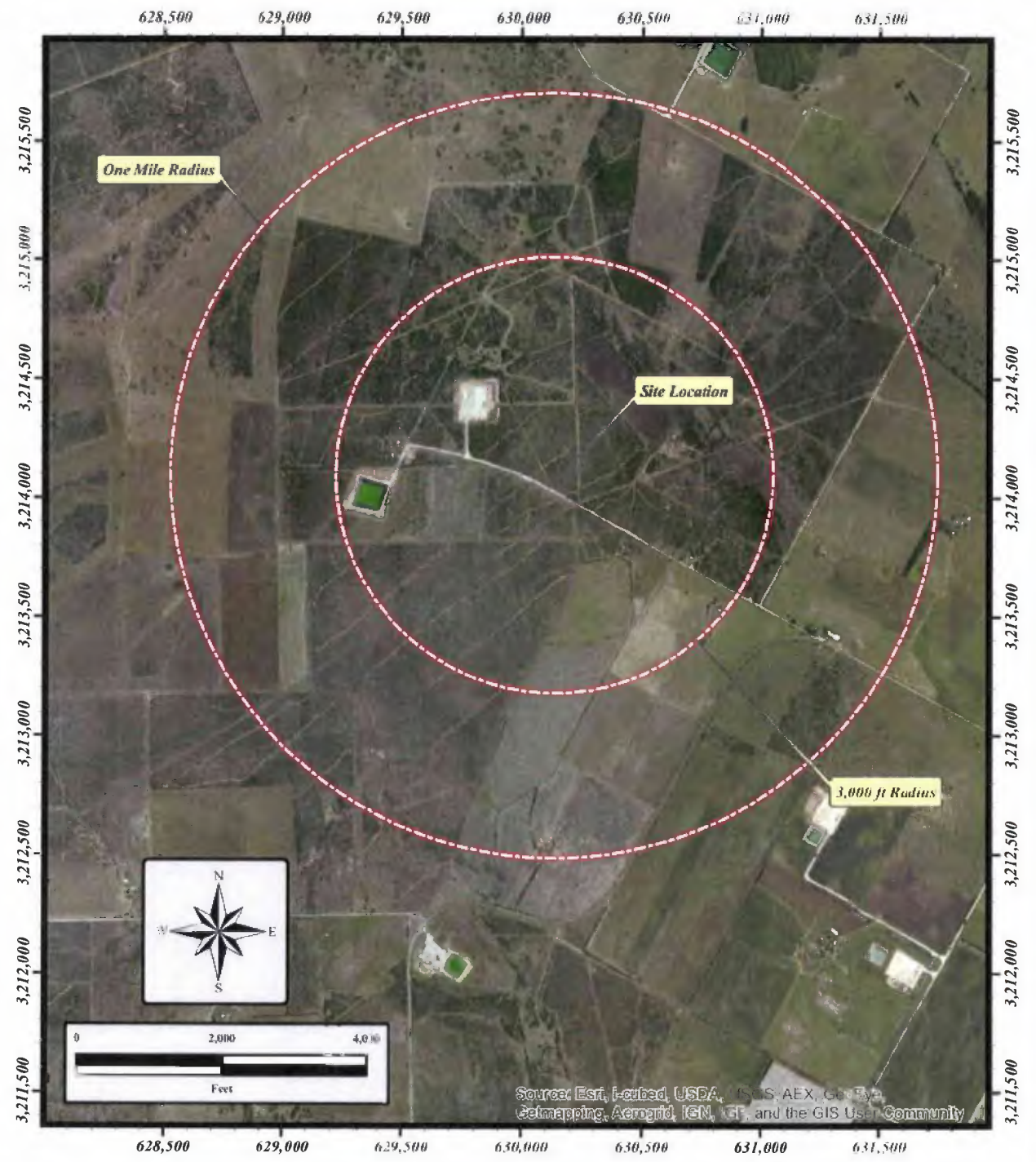
Scheduled Maintenance Startup and Shutdown Events

In accordance with TCEQ guidance and the non-rule Oil & Gas Standard Permit, a representation of planned Maintenance, Startup and Shutdown events are included in this Standard Permit registration in addition to the normal operating scenario.

It is conservatively planned that the flare will be down for maintenance 2% of the year. During this time, the well would be shut in and therefore gas and liquids would not be producing, but any liquids previously in storage tanks (FINs TK-01, TK-02, TK-03 and TK-04) would have standing losses emitted to atmosphere.

Additionally, as the engines are brought down for maintenance or operational adjustments, the volume of gas in the compressor units will blow down, resulting in emissions. These blowdown events (FINs COMP-01-BD) are captured and routed to the flare (FIN FL-1-SMSS) and emissions are controlled at a 98% capture and combustion efficiency. As these engines are brought back online, starter vent (FINs COMP-01-SV) emissions occur to atmosphere as natural gas is routed through the engines as it builds up pressure.

Attachment 3 contains emission rate calculations for the air emission sources and a summary of the Site's emission rates.



Grid Presented is UTM Zone 14, NAD 1983

FIGURE 1-1 AREA MAP

Burlington Resources Oil & Gas Company LP
Standard Permit Registration
DeWitt Central Facility 3
TITAN Project No. 84800507-12.002
May 2013

from USGS Quadrangle Garfield, Texas
Ground Condition Depicted May 2011
Digital Data Courtesy of ESRI Online Datasets

TITAN Engineering, Inc.
2801 Network Boulevard, Suite 200
Frisco, Texas 75034
Phone: (469) 365-1100 Fax: (469) 365-1199
www.titan-engineering.com | www.apexcos.com
A Division of Apex Companies, LLC

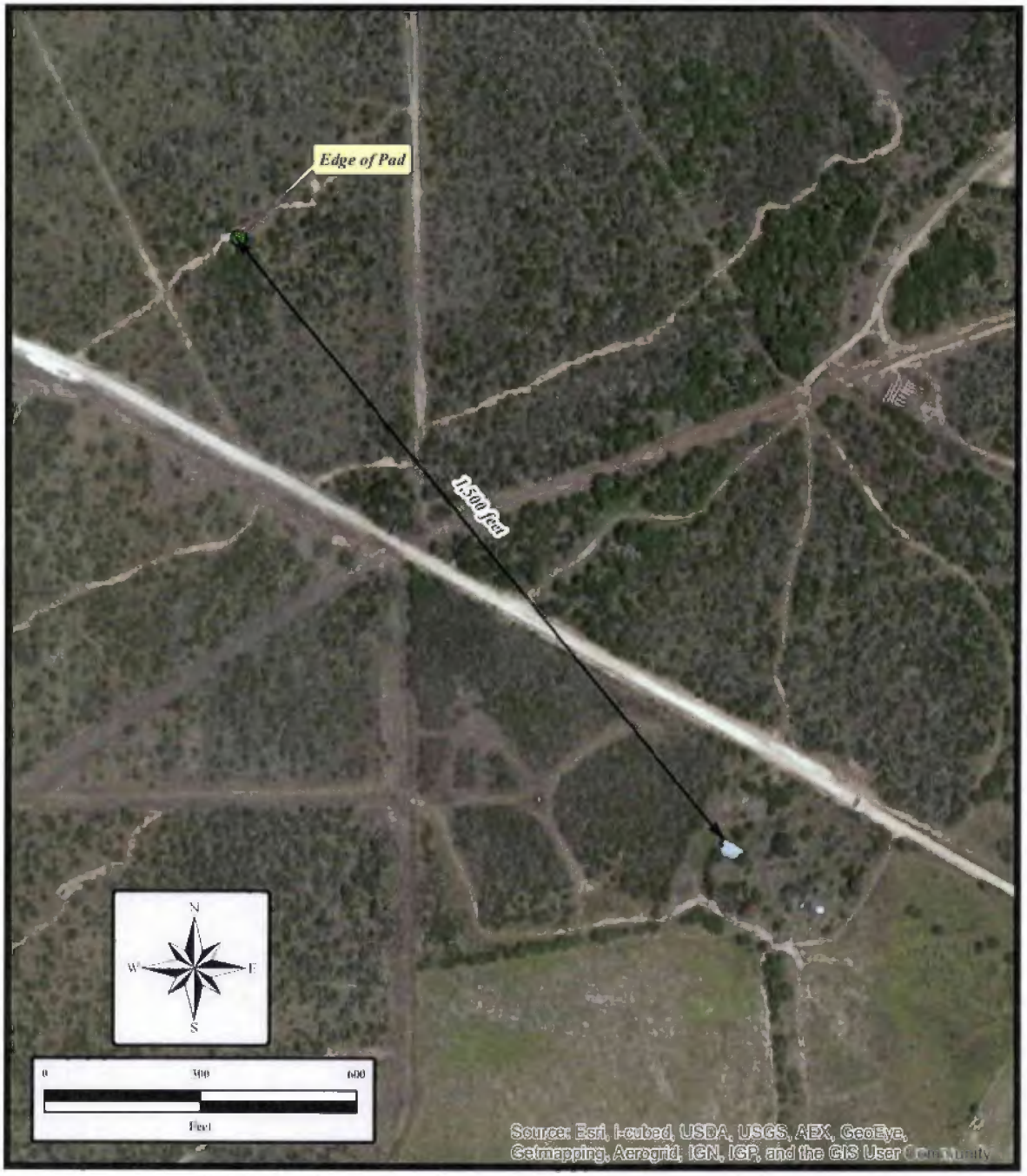


FIGURE 1-2 RECEPTOR MAP

Burlington Resources Oil & Gas Company LP
Standard Permit Registration
DeWitt Central Facility 3
TITAN Project No. 84800507-12.002
May 2013
from USGS Quadrangle Garfield, Texas
Ground Condition Depicted May 2011
Digital Data Courtesy of ESRI Online Datasets

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Frisco, Texas 75034
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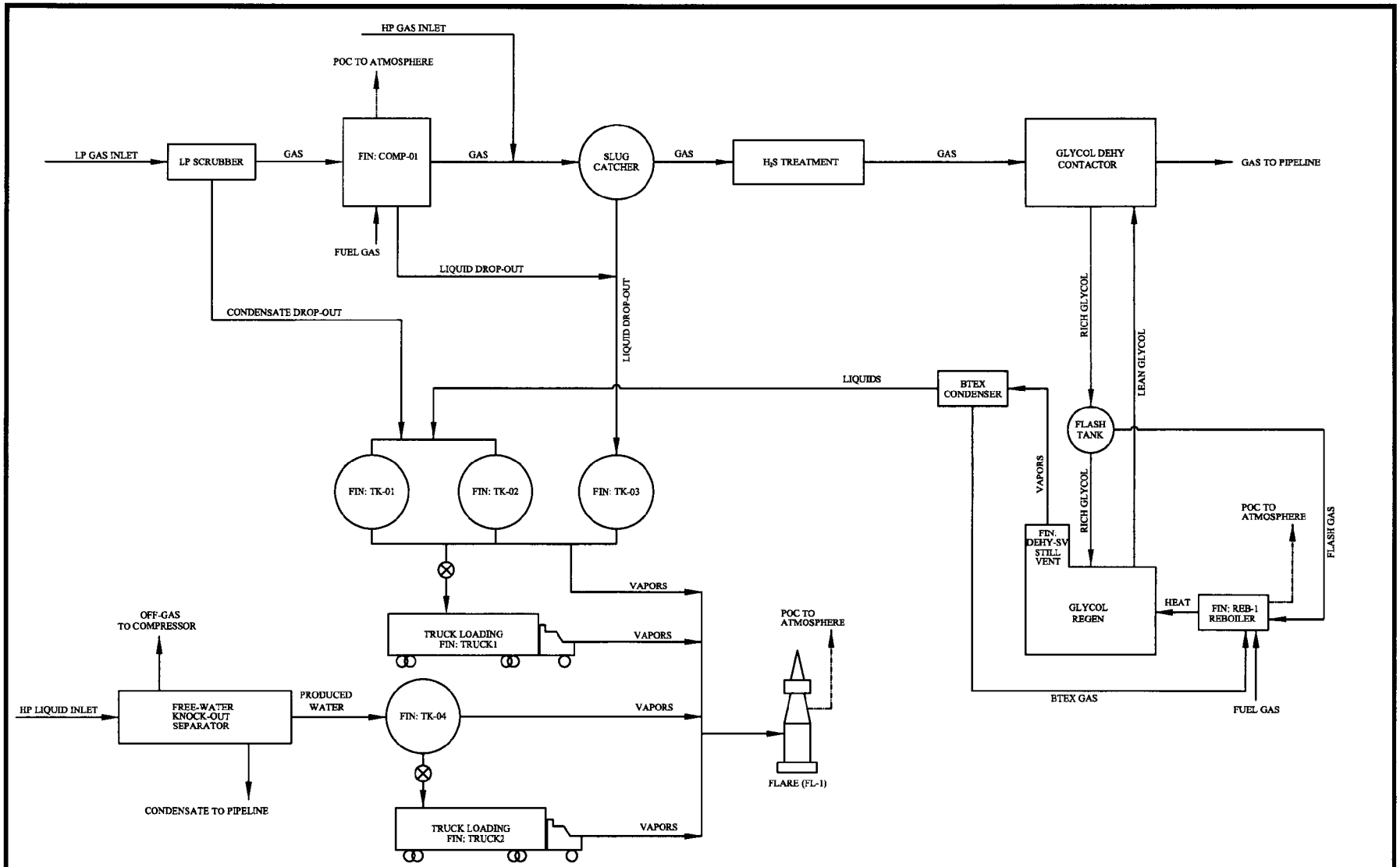
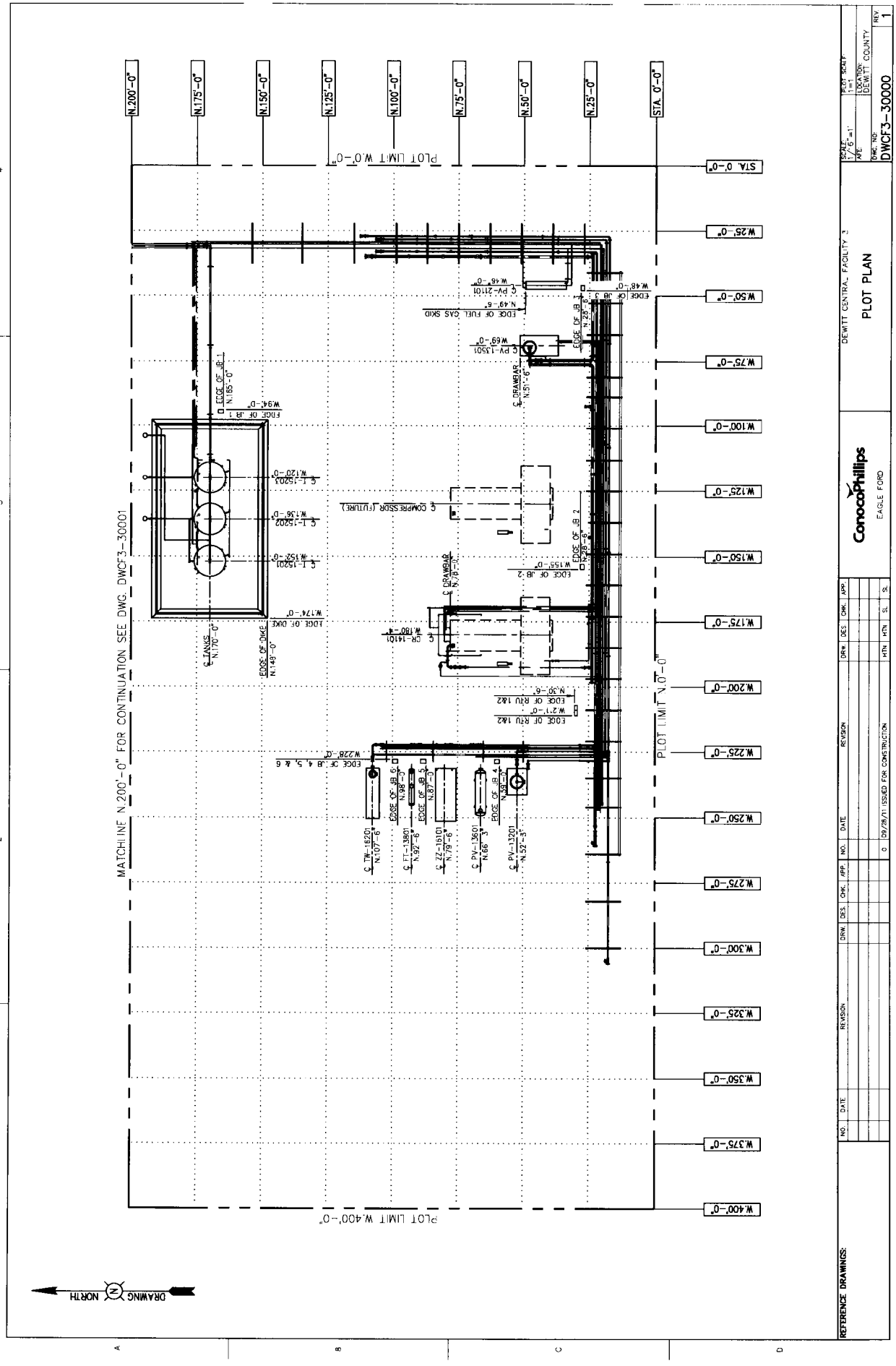


TITAN Engineering, Inc.
2801 NETWORK BLVD.
SUITE 200
FRISCO, TEXAS 75034
(469) 365-1100 (469) 365-1199 fax
www.titanengineering.com

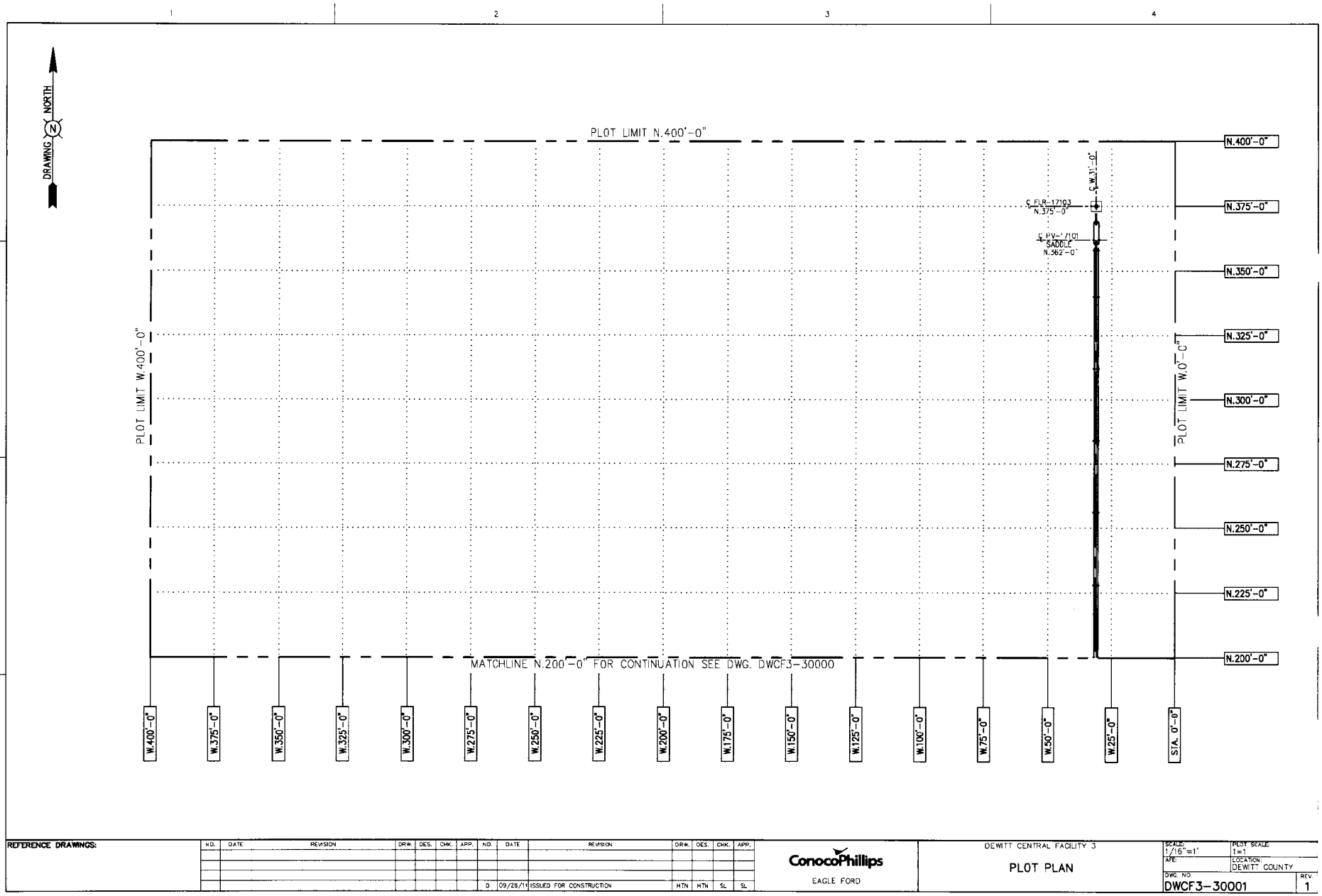
FIGURE 1-3
SIMPLIFIED PROCESS FLOW DIAGRAM

Burlington Resources Oil & Gas Company L.P.
DeWitt Central Facility 3
Standard Permit Registration

DESIGNED BY:	DETAILED BY:	CHECKED BY:
Burlington	VCC	CIC
FILE NAME: T:\ConocoPhillips\507-75 CF Registrations		
DATE: May 2013	PROJECT NO.: 84800507-12.002	PLOT SCALE: NTS
DRAWING NO.: TEI-0000	REVISION: 2	FIGURE: 1-3


N.200'-0"
N.175'-0"
N.150'-0"
N.125'-0"
N.100'-0"
N.75'-0"
N.50'-0"
N.25'-0"
STA. 0'-0"
PLOT LIMIT W.0'-0"
PLOT LIMIT W.400'-0"
PLOT LIMIT N.0'-0"
MATCH LINE N.200'-0" FOR CONTINUATION SEE DWG. DWCF3-30001
EDGE OF FUEL GAS SKID
EDGE OF JB 1
EDGE OF JB 2
EDGE OF JB 3
EDGE OF JB 4, 5, & 6
EDGE OF RTU 1&2
EDGE OF DIKE
EDGE OF DIKE
℄ COMPRESSOR (FUTURE)
℄ DRAWBAR
℄ TANKS
℄ PY-2110
℄ PY-1350
℄ CR-1410
℄ TW-1820
℄ FT-1380
℄ ZZ-1910
℄ PV-1360
℄ PV-1320
℄ 1-1520
DRAWING NORTH
DEWITT CENTRAL FACILITY 3
PLOT PLAN
ConocoPhillips
EAGLE FORD
SCALE: 1"=40'-0"
APE
DWG. NO: DWCF3-30000
REV. 1
LOCATION: DEWITT COUNTY
REFERENCE DRAWINGS:
NO. DATE REVISION DRW. DES. CHK. APP.
0 09/28/11 ISSUED FOR CONSTRUCTION HTN HTN SL SL

1-6



REFERENCE DRAWINGS:	NO.	DATE	REVISION	DRW.	DES.	CHK.	APP.
	D	09/25/11	ISSUED FOR CONSTRUCTION	HTN	HTN	SL	SL

ConocoPhillips
EAGLE FORD

DEWITT CENTRAL FACILITY 3

PLOT PLAN

SCALE: 1/16"=1'	PLOT SCALE: 1=1
AFE:	LOCATION: DEWITT COUNTY
DWG. NO.: DWCF3-30001	REV.: 1

ATTACHMENT 2
TCEQ FORMS AND TABLES

OIL AND GAS STANDARD PERMIT REGISTRATION

DEWITT CENTRAL FACILITY 3

BURLINGTON RESOURCES OIL & GAS COMPANY LP

Texas Commission on Environmental Quality

OGS New Project Notification for New Registration

Site Information (Regulated Entity)

What is the name of the site to be authorized?	DEWITT CENTRAL FACILITY 3
Does the site have a physical address?	
County	DEWITT
Latitude (N) (##.######)	29.04979
Longitude (W) (-###.######)	-97.664314
Primary SIC Code	1311
Secondary SIC Code	
Primary NAICS Code	211111
Secondary NAICS Code	
Regulated Entity Site Information	
What is the Regulated Entity's Number (RN)?	RN106432263
What is the name of the Regulated Entity (RE)?	DEWITT CENTRAL FACILITY 3
Does the RE site have a physical address?	No
Because there is no physical address, describe how to locate this site:	FR THE INTX OF 72 & 119 IN YORKTOWN HEAD N ON 119 FOR 8.9 MI GO L ON FRANK KOZIELSKI RD THEN R ON GARFIELD RD GO 1.2 MI KEEP SLIGHT R TO STAY ON GEORGE KLEIN RD GO 0.6 MI SITE ON R
City	YORKTOWN
State	TX
ZIP	78164
County	DEWITT
Latitude (N) (##.######)	
Longitude (W) (-###.######)	
What is the primary business of this entity?	NATURAL GAS PRODUCTION

Burling-Customer (Applicant) Information

How is this applicant associated with this site?	Owner Operator
What is the applicant's Customer Number (CN)?	CN602989436
Type of Customer	Corporation
Full legal name of the applicant:	
Legal Name	Burlington Resources Oil & Gas Company LP
Texas SOS Filing Number	14500511

Federal Tax ID	
State Franchise Tax ID	32003073841
DUNS Number	131117566
Number of Employees	501+
Independently Owned and Operated?	Yes
I certify that the full legal name of the entity applying for this permit has been provided and is legally authorized to do business in Texas.	Yes
Responsible Authority Contact	
Organization Name	Burlington Resources Oil & Gas Company LP
Prefix	
First	James
Middle	
Last	Woodal
Suffix	
Title	SR. ENVIRONMENTAL SPECIALIST
Responsible Authority Mailing Address	
Enter new address or copy one from list:	
Address Type	Domestic
Mailing Address (include Suite or Bldg. here, if applicable)	600 N DAIRY ASHFORD RD
Routing (such as Mail Code, Dept., or Attn:)	WESTLAKE 3, #15012
City	HOUSTON
State	TX
ZIP	77079
Phone (###-###-####)	8324866508
Extension	
Alternate Phone (###-###-####)	
Fax (###-###-####)	8324866431
E-mail	JAMES.WOODALL@CONOCOPHILLIPS.COM

Responsible Official Contact

Person TCEQ should contact for questions about this application:	
Same as another contact?	
Organization Name	Burlington Resources Oil & Gas Company LP
Prefix	MR
First	Randy

Middle	
Last	Black
Suffix	
Title	MANAGER OF PRODUCTION OPERATIONS - GCBU
Enter new address or copy one from list:	Burlington Resources Oil & Gas Company LP
Mailing Address	
Address Type	Domestic
Mailing Address (include Suite or Bldg. here, if applicable)	600 N DAIRY ASHFORD RD
Routing (such as Mail Code, Dept., or Attn:)	WESTLAKE 3, #15012
City	HOUSTON
State	TX
ZIP	77079
Phone (###-###-####)	8324866508
Extension	
Alternate Phone (###-###-####)	
Fax (###-###-####)	8324866431
E-mail	RANDY.C.BLACK@CONOCOPHILLIPS.COM

Technical Contact

Person TCEQ should contact for questions about this application:	
Same as another contact?	Burlington Resources Oil & Gas Company LP
Organization Name	Burlington Resources Oil & Gas Company LP
Prefix	MR
First	James
Middle	
Last	Woodal
Suffix	
Title	SR. ENVIRONMENTAL SPECIALIST
Enter new address or copy one from list:	Burlington Resources Oil & Gas Company LP
Mailing Address	
Address Type	Domestic
Mailing Address (include Suite or Bldg. here, if applicable)	600 N DAIRY ASHFORD RD
Routing (such as Mail Code, Dept., or Attn:)	WESTLAKE 3, #15012
City	HOUSTON

State	TX
ZIP	77079
Phone (###-###-####)	8324866508
Extension	
Alternate Phone (###-###-####)	
Fax (###-###-####)	8324866431
E-mail	JAMES.WOODALL@CONOCOPHILLIPS.COM

OGS New Project Notification

1) Select the authorization this site or changes to this site will most likely be authorized under based on expected worst-case operations (including planned MSS activities if MSS emissions are being registered with this project).	6002 - NON RULE 2012-NOV-08
2) What is the lease name submitted to the Railroad Commission (RRC)? If there are well(s) co-located with the site, include the well number(s) assigned by the RRC.	NA
3) Provide a brief process description for this site or description of changes to this site.	The site will collect hydrocarbon liquids from nearby production sites. Low pressure gas will be sent to compression, routed to a dehydration unit and sent down the pipeline. Hydrocarbon liquids are collected and sent offsite periodically.
4) What is the site's latitude? (North)	29.049790
5) What is the site's longitude? (West)	-97.664314
6) What method was used to determine the site's latitude and longitude?	Map
7) Does this business qualify as a small business, non-profit organization, or small government entity?	No

Signature

The signature below indicates to the best of my knowledge that the information submitted is true and complete, and that I have signature authority to submit this application on behalf of the regulated entity.

1. I am James Woodall, the owner of the STEERS account ER020324.
2. I have the authority to sign this data on behalf of the applicant named above.
3. I have personally examined the foregoing and am familiar with its content and the content of any attachments, and based upon my personal knowledge and/or inquiry of any individual responsible for information contained herein, that this information is true, accurate, and complete.
4. I further certify that I have not violated any term in my TCEQ STEERS participation agreement and that I

have no reason to believe that the confidentiality or use of my password has been compromised at any time.

5. I understand that use of my password constitutes an electronic signature legally equivalent to my written signature.
6. I also understand that the attestations of fact contained herein pertain to the implementation, oversight and enforcement of a state and/or federal environmental program and must be true and complete to the best of my knowledge.
7. I am aware that criminal penalties may be imposed for statements or omissions that I know or have reason to believe are untrue or misleading.
8. I am knowingly and intentionally signing OGS New Project Notification for New Registration.
9. My signature indicates that I am in agreement with the information on this form, and authorize its submittal to the TCEQ.

OWNER OPERATOR Signature: James Woodall OWNER OPERATOR

Account Number:	ER020324
Signature IP Address:	138.32.80.20
Signature Date:	2013-05-06
Signature Hash:	AA06BD67D3B72ED49336BE1B65B794CDB78BFA0ECB7C0D5E82BDCEE54CEC562C
Form Hash Code at time of Signature:	CC4648E7CFC2B691C1B3D4BBB05FE029D7366811E715E545CD2D7CAAD2C47616

Fee Payment

Transaction by:	The application fee payment transaction was made by ER025071/Christina I Chermak
Paid by:	The application fee was paid by CHRISTINA CHERMAK
Fee Amount:	$50.00
Paid Date:	The application fee was paid on 2013-05-06
Transaction/Voucher number:	The transaction number is 582EA000141708 and the voucher number is 178380

Submission

Reference Number:	The application reference number is 66157
Submitted by:	The application was submitted by ER025071/Christina I Chermak
Submitted Timestamp:	The application was submitted on 2013-05-06 at 15:11:02 CDT
Submitted From:	The application was submitted from IP address 12.237.12.100
Confirmation Number:	The confirmation number is 69078
Steers Version:	The STEERS version is 5.88

Texas Commission on Environmental Quality
Table 29 Reciprocating Engines

I. Engine Data			
Manufacturer: Caterpillar	Model No. G3516TALE	Serial No. 410963	Manufacture Date: 9/28/2005
Rebuilds Date: N/A	No. of Cylinders: 16	Compression Ratio: 8:0:1	EPN: COMP-01

Application: ☒ Gas Compression ☐ Electric Generation ☐ Refrigeration ☐ Emergency/Stand by

☒ 4 Stroke Cycle ☐ 2 Stroke Cycle ☐ Carbureted ☐ Spark Ignited ☐ Dual Fuel ☐ Fuel Injected

☐ Diesel ☐ Naturally Aspirated ☐ Blower /Pump Scavenged ☒ Turbo Charged and I.C. ☐ Turbo Charged

☐ Intercooled ☐ I.C. Water Temperature ☒ Lean Burn ☐ Rich Burn

Ignition/Injection Timing: Fixed: | Variable: Yes

Manufacture Horsepower Rating: 1340 | Proposed Horsepower Rating:

Discharge Parameters

Stack Height (Feet)	Stack Diameter (Feet)	Stack Temperature (°F)	Exit Velocity (FPS)
20	1.0	873	162.61

II. Fuel Data

Type of Fuel: ☒ Field Gas ☐ Landfill Gas ☐ LP Gas ☐ Natural Gas ☐ Digester Gas ☐ Diesel

Fuel Consumption (BTU/bhp-hr): 7405 | Heat Value: (HHV) (LHV)

Sulfur Content (grains/100 scf - weight %): 10 ppm

III. Emission Factors (Before Control)

NO_X		CO		SO_2		VOC		Formaldehyde		PM10	
g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv

Source of Emission Factors: ☐ Manufacturer Data ☐ AP-42 ☐ Other (specify):

IV. Emission Factors (Post Control)

NO_X		CO		SO2		VOC		Formaldehyde		PM10	
g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv
2.0		3.0				0.70					

Method of Emission Control: ☐ NSCR Catalyst ☒ Lean Operation ☐ Parameter Adjustment

☐ Stratified Charge ☐ JLCC Catalyst ☒ Other (Specify): SCR Catalyst & Air-fuel Ratio Control

Note: Must submit a copy of any manufacturer control information that demonstrates control efficiency.

Is Formaldehyde included in the VOCs? ☒ Yes ☐ No

V. Federal and State Standards (Check all that apply)

☐ NSPS JJJJ ☒ MACT ZZZZ ☐ NSPS IIII ☐ Title 30 Chapter 117 - List County: _____

VI. Additional Information

1. Submit a copy of the engine manufacturer's site rating or general rating specification data.
2. Submit a typical fuel gas analysis, including sulfur content and heating value. For gaseous fuels, provide mole percent of constituents.
3. Submit description of air/fuel ratio control system (manufacturer information is acceptable).

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emissions Point Summary

Permit Number:	109919	RN Number:	RN106432263	Date:	May 2013
Company Name:	Burlington Resources Oil & Gas Company LP - DEWITT CENTRAL FACILITY 3				

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table.

AIR CONTAMINANT DATA						EMISSION POINT DISCHARGE PARAMETERS										
1. Emission Point			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate		4. UTM Coordinates of Emission Point			5. Building Height (ft)	6. Height Above Ground (ft)	7. Stack Exit Data			8. Fugitives		
EPN (A)	FIN (B)	NAME (C)		Pounds per hour (A)	TPY (B)	Zone	East (meters)	North (meters)			Diameter (ft) (A)	Velocity (fps) (B)	Temp. (°F) (C)	Length (ft) (A)	Width (ft) (B)	Axis Degrees (C)
Normal Operations																
COMP-01	COMP-01	Compressor Engine 1	CO	8.86	38.81	14	--	--	--	20.0	1	162.61	873	--	--	--
			NOx	5.91	25.89											
			$PM/PM_{10}/PM_{2.5}$	0.10	0.44											
			SO2	0.01	0.04											
			VOC	2.07	9.07											
			Benzene	0.01	0.04											
			CH_2O	0.52	2.28											
FUG	FUG	Site Fugitives	VOC	0.78	3.40	14	--	--	--	3.0	--	--	--	--	--	--
			Benzene	0.01	0.04											
			H_2S	0.001	0.004											
REB-1	REB-1	Glycol Reboiler No. 1	CO	0.04	0.18	14	--	--	--	14.3	--	--	--	--	--	--
			NOx	0.05	0.22											
			$PM/PM_{10}/PM_{2.5}$	0.004	0.02											
			SO_2	0.001	0.004											
			VOC	0.003	0.01											
			Benzene	0.000001	0.000004											
			CH_2O	0.00004	0.0002											
REB-1	DEHY-SV	Glycol Dehy Still Vent	VOC	1.26	5.52	14	--	--	--	14.3	--	--	--	--	--	--
			Benzene	0.05	0.21											
			H_2S	0.01	0.05											
FL-1	TK-01	Controlled Condensate Tank Emissions	VOC	2.45	9.07	14	--	--	--	30.0	--	--	--	--	--	--
	TK-02		Benzene	0.01	0.03											
			H_2S	0.001	0.01											
FL-1	TK-03	Controlled Slop Tank Emissions	VOC	0.22	0.04	14				30.0						
			Benzene	0.002	0.0004											
FL-1	TK-04	Controlled PW Tank Emissions	VOC	0.06	0.24	14	--	--	--	30.0	--	--	--	--	--	--
			Benzene	0.0002	0.001											
			H_2S	0.00004	0.0002											
FL-1	TRUCK1	Controlled Condensate Truck Loading	VOC	1.97	0.95	14	--	--	--	30.0	--	--	--	--	--	--
			Benzene	0.02	0.01											
FL-1	TRUCK2	Controlled Produced Water Truck Loading	VOC	0.02	0.004	14	--	--	--	30.0	--	--	--	--	--	--
			Benzene	0.0001	0.00002											
FL-1	FL-1	Flare Combustion (normal operations waste gas, assist, and pilot)	CO	2.77	9.22	14	--	--	--	30.0	--	--	--	--	--	--
			NO_X	1.38	4.60											
			SO_2	0.23	1.01											
			H_2S	0.001	0.01											
			VOC	0.01	0.04											
			Benzene	0.000003	0.00001											
TK-AF	TK-AF	Antifreeze Liquid Storage	VOC	0.50	0.01	14	--	--	--	--	--	--	--	--	--	--
TK-LO	TK-LO	Lube Oil Liquid Storage	VOC	0.0002	0.000002	14	--	--	--	--	--	--	--	--	--	--
TK-SCAV	TK-SCAV	H2S Scavenger Liquid Storage	VOC	<0.01	<0.01	14	--	--	--	--	--	--	--	--	--	--

TCEQ-10153 (Revised 01-15-03)
Table 1(a) - Emission Point Summary - These forms are for use by sources subject to the New Source Review Program and may be revised [ANSRG95A:7026.v2]

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emissions Point Summary

Point Number:	109919	RN Number:	RN106432263	Date:	May 2013
Company Name:	Burlington Resources Oil & Gas Company LP - DEWITT CENTRAL FACILITY 3				

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table.

AIR CONTAMINANT DATA						EMISSION POINT DISCHARGE PARAMETERS											
1. Emission Point			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate		4. UTM Coordinate of Emission Point			5. Stack Height (ft)	6. Stack Diameter (ft)		Stack Exit Data			8. Fugitive		
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)	Zone	East (Meters)	North (Meters)		Height Above Ground (ft)	(A)	Velocity (fps) (B)	Temperature (°F) (C)	Length (ft) (A)	Width (ft) (B)	Axis Degrees (C)	
Scheduled Maintenance Startup and Shutdown Events																	
COMP-01-SV	COMP-01-SV	Compressor Engine 1 Starter Vent	VOC	24.16	0.63	14	--	--	--	20.0	--	--	--	--	--	--	
			Benzene	0.16	0.004												
			H_2S	0.06	0.002												
FL-1-SMSS	COMP-01-BD	Compressor Engine 1 Blowdown	VOC	0.57	0.01	14	--	--	--	30.0	--	--	--	--	--	--	
			Benzene	0.004	0.0001												
			H_2S	0.001	0.00004												
FL-1-SMSS	FL-1-SMSS	Flare Combustion (Blowdowns waste gas)	CO	0.42	10.96	14	--	--	--	30.0	--	--	--	--	--	--	
			NO_X	0.21	5.49												
			SO_2	0.13	0.004												
			H_2S	0.001	0.00004												
TK-01	TK-01	Uncontrolled Condensate Tank Standing Loss Emissions (during flare downtime)	VOC	0.00	0.00	14	--	--	--	25.0	--	--	--	--	--	--	
TK-02	TK-02		Benzene	0.00	0.00												
TK-03	TK-03	Uncontrolled Slop Tank Standing Loss Emissions (during flare downtime)	VOC	0.00	0.00	14	--	--	--	25.0	--	--	--	--	--	--	
			Benzene	0.00	0.00												
TK-04	TK-04	Uncontrolled PW Tank Standing Loss Emissions (during flare downtime)	VOC	0.001	0.0001	14	--	--	--	25.0	--	--	--	--	--	--	
			Benzene	0.00001	0.000001												

ATTACHMENT 3
EMISSION RATE CALCULATIONS

OIL AND GAS STANDARD PERMIT REGISTRATION

DEWITT CENTRAL FACILITY 3

BURLINGTON RESOURCES OIL & GAS COMPANY LP

TABLE 3-1
SUMMARY OF PROPOSED ALLOWABLE EMISSION RATES
OIL & GAS STANDARD PERMIT REGISTRATION
DEWITT CENTRAL FACILITY 3
BURLINGTON RESOURCES OIL & GAS COMPANY LP

			Proposed Allowable Hourly and Annual Emission Rates													
			VOC		NO_X		CO		$PM/PM_{10}/PM_{2.5}$		SO_2		H_2S		CH_2O		Benzene	
EPN	FIN	Description	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)
Normal Operations																		
COMP-01	COMP-01	Compressor Engine 1	2.07	9.07	5.91	25.89	8.86	38.81	0.10	0.44	0.01	0.04	--	--	0.52	2.28	0.01	0.04
FUG	FUG	Site Fugitives	0.78	3.40	--	--	--	--	--	--	--	--	0.001	0.004	--	--	0.01	0.04
REB-1	REB-1	Glycol Reboiler No. 1	0.003	0.01	0.05	0.22	0.04	0.18	0.004	0.02	0.001	0.004	--	--	0.00004	0.0002	0.000001	0.000004
REB-1	DEHY-SV	Glycol Dehy Still Vent	1.26	5.52	--	--	--	--	--	--	--	--	0.01	0.05	--	--	0.05	0.21
FL-1	TK-01 TK-02	Controlled Condensate Tank Emissions	2.45	9.07	--	--	--	--	--	--	--	--	0.001	0.01	--	--	0.01	0.03
FL-1	TK-03	Controlled Slop Tank Emissions	0.22	0.04	--	--	--	--	--	--	--	--	--	--	--	--	0.002	0.0004
FL-1	TK-04	Controlled PW Tank Emissions	0.06	0.24	--	--	--	--	--	--	--	--	0.00004	0.0002	--	--	0.0002	0.001
FL-1	TRUCK1	Controlled Condensate Truck Loading	1.97	0.95	--	--	--	--	--	--	--	--	--	--	--	--	0.02	0.01
FL-1	TRUCK2	Controlled Produced Water Truck Loading	0.02	0.004	--	--	--	--	--	--	--	--	--	--	--	--	0.0001	0.00002
FL-1	FL-1	Flare Combustion (normal operations waste gas, assist, and pilot)	0.01	0.04	1.38	4.60	2.77	9.22	--	--	0.23	1.01	0.001	0.01	--	--	0.000003	0.00001
TK-AF	TK-AF	Antifreeze Liquid Storage	0.50	0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TK-LO	TK-LO	Lube Oil Liquid Storage	0.0002	0.000002	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TK-SCAV	TK-SCAV	H_2S Scavenger Liquid Storage	<0.01	<0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Scheduled Maintenance, Startup and Shutdown Events																		
COMP-01-SV	COMP-01-SV	Compressor Engine 1 Starter Vent	24.16	0.63	--	--	--	--	--	--	--	--	0.06	0.002	--	--	0.16	0.004
FL-1-SMSS	COMP-01-BD	Compressor Engine 1 Blowdown	0.57	0.01	--	--	--	--	--	--	--	--	0.001	0.00004	--	--	0.004	0.0001
FL-1-SMSS	FL-1-SMSS	Flare Combustion (Blowdowns waste gas)	--	--	0.21	5.49	0.42	10.96	--	--	0.13	0.004	0.001	0.00004	--	--	--	--
TK-01	TK-01	Uncontrolled Condensate Tank Standing Loss Emissions (during flare downtime)	0.00	0.00	--	--	--	--	--	--	--	--	--	--	--	--	0.00	0.00
TK-02	TK-02																	
TK-03	TK-03	Uncontrolled Slop Tank Standing Loss Emissions (during flare downtime)	0.00	0.00	--	--	--	--	--	--	--	--	--	--	--	--	0.00	0.00
TK-04	TK-04	Uncontrolled PW Tank Standing Loss Emissions (during flare downtime)	0.001	0.0001	--	--	--	--	--	--	--	--	--	--	--	--	0.00001	0.000001
		Site-Wide Emissions:	**34.07**	**28.99**	**7.55**	**36.20**	**12.09**	**59.17**	**0.10**	**0.46**	**0.37**	**1.06**	**0.08**	**0.08**	**0.52**	**2.28**	**0.27**	**0.34**

CALCULATION OF COMPRESSOR ENGINE POTENTIAL TO EMIT

OIL & GAS STANDARD PERMIT REGISTRATION

DEWITT CENTRAL FACILITY 3

BURLINGTON RESOURCES OIL & GAS COMPANY LP

			Engine Ratings			Annual Operating					Potential to Emit (PTE)	
EPN	FIN	Description	Type	Rated Horsepower (hp)	Fuel Consumption (Btu/hp-hr)	Hours (hr/yr)	Pollutant	Emission Factors [a]	Units	Hourly [a] (lb/hr)	Annual [b] (T/yr)
COMP-01	COMP-01	Compressor Engine 1	Caterpillar G3516TALE	1,340	7,405	8,760	CO	3.00	g/hp-hr	8.86	38.81
			Lean Burn				NO_X	2.00	g/hp-hr	5.91	25.89
			Catalyst				$PM/PM_{10}/PM_{2.5}$	0.0099871	lb/MMBtu	0.10	0.44
			AFR Controller				SO_2	10	ppm S	0.01	0.04
							VOC	0.70	g/hp-hr	2.07	9.07
							CH_2O	0.0528	lb/MMBtu	0.52	2.28
							Benzene[c]	0.003	g/hp-hr	0.01	0.04

[a] The Emission Factors for engines COMP-01 for CO, NO_X and VOC are based on vendor data and conservately represented. The VOC emission factor includes the CH_2O emission factor from AP-42 because the vendor provided information does not include formaldehyde. An example calculation for hourly CO emissions for EPN COMP-01 follows:

CO (lb/hr) = (Rated Horsepower, hp)*(Emission Factor, g/hp-hr)*(1 lb/453.59 g)

CO (lb/hr) = (1340 hp)*(3.00 g/hp-hr)*(1 lb/453.59 g)

= 8.86 lb/hr CO

The PM/PM_{10} and CH_20 Emission Factors for EPN COMP-01 and COMP-02 are from AP-42 Chapter 3. An example calculation for hourly PM emissions for EPN COMP-01 follows:

PM (lb/hr) = (Fuel Consumption, Btu/hp-hr)*(Rated Horsepower, hp)*(1 MMBtu/10^6 Btu)*(Emission Factor, lb/MMBtu)

PM (lb/hr) = (7,405 Btu/hp-hr)*(1,340 hp)*(1 MMBtu/10^6 Btu)*(0.009987 lb/MMBtu)

= 0.10 lb/hr PM

A material balance approach was used to estimate the SO_2 emission rates using the maximum sulfur concentration in the natural gas. H_2S Scavenger liquids are used to bring the fuel gas H_2S concentration below 10 ppm S. An example calculation for hourly SO_2 emissions for EPN COMP-01 follows:

SO_2 (lb/hr) = (Fuel Consumption, Btu/hp-hr)*(Rated Horsepower, hp)/(Lower Fuel Heating Value, Btu/scf)*(Sulfur Content, ppmv)*(1 lb-mol/379 scf)*(32.06 lb S/lb-mol)*(64.06 lb SO_2/32.06 lb S)

SO_2 (lb/hr) = (7,418 Btu/hp-hr)*(276 hp)/(1,235 Btu/scf)*(10 scf S/10^6 scf gas)*(1 lb-mol/379 scf)*(32.06 lb S/lb-mol)*(64.06 lb SO2/32.06 lb S)

= 0.01 lb/hr SO_2

[b] An example calculation for annual CO emissions for EPN COMP-01 follows:

CO (T/yr) = (Hourly PTE, lb/hr)*(Annual Operating Hours, hr/yr)*(1 T/2,000 lb)

CO (T/yr) = (8.86 lb/hr)*(8,760 hr/yr)*(1 T/2,000 lb)

= 38.81 T/yr CO

[c] An example calculation for benzene emission factor (EF) for EPN COMP-01 follows:

Benzene EF (g/hp-hr) = (VOC emission factor, g/hp-hr)*(Benzene AP-42 Emission Factor, lb/MMBtu) / (VOC AP-42 Emission Factor, lb/MMBtu

Benzene EF (g/hp-hr) = (0.70) * (0.00044 lb/MMBtu) / (0.118 lb/MMBtu)

= 0.003 g/hp-hr

CALCULATION OF SITE FUGITIVES (FIN FUG) POTENTIAL TO EMIT

OIL & GAS STANDARD PERMIT REGISTRATION

DEWITT CENTRAL FACILITY 3

BURLINGTON RESOURCES OIL & GAS COMPANY LP

Component	Number of Components	Emission Factors [a] (lb/hr-component)	Annual Operating Hours (hr/yr)	Maximum VOC [a] (wt%)	Maximum Benzene [a] (wt%)	Maximum H_2S (wt%)	Reduction Credit [a] (%)	PTE VOC Hourly [b] (lb/hr)	PTE VOC Annual [c] (T/yr)	PTE Benzene Hourly [b] (lb/hr)	PTE Benzene Annual [c] (T/yr)	PTE H_2S Hourly [b] (lb/hr)	PTE H_2S Annual [c] (T/yr)
Valves													
Gas Streams	75	0.00992	8,760	40%	0.65%	0.10%	0%	0.30	1.30	0.005	0.02	0.001	0.003
Light Oil	54	0.0055	8,760	100%	0.98%	--	0%	0.30	1.30	0.003	0.01	--	--
Water/Light Oil	55	0.000216	8,760	--	0.50%	--	0%	0.01	0.05	0.0001	0.0003	--	--
Pumps seals													
Water/Light Oil	3	0.000052	8,760	--	0.50%	--	0%	0.0002	0.001	0.000001	0.000003	--	--
Compressors seals													
Gas Streams	4	0.0194	8,760	40%	0.65%	0.10%	0%	0.03	0.14	0.001	0.002	0.0001	0.0003
Flanges													
Gas Streams	88	0.00086	8,760	40%	0.65%	0.10%	0%	0.03	0.13	0.0005	0.002	0.0001	0.0003
Light Oil	29	0.000243	8,760	100%	0.98%	--	0%	0.01	0.03	0.0001	0.0003	--	--
Water/Light Oil	10	0.000006	8,760	--	0.50%	--	0%	0.0001	0.0003	0.0000003	0.000001	--	--
Connectors													
Gas Streams	123	0.00044	8,760	40%	0.65%	0.10%	0%	0.02	0.09	0.0004	0.002	0.0001	0.0002
Light Oil	113	0.000463	8,760	100%	0.98%	--	0%	0.05	0.23	0.001	0.002	--	--
Water/Light Oil	124	0.000243	8,760	--	0.50%	--	0%	0.03	0.13	0.0002	0.001	--	--
							TOTAL:	**0.78**	**3.40**	**0.01**	**0.04**	**0.001**	**0.004**

[a] Fugitive Emission Factors and Reduction Credits are per TCEQ Technical Guidance Document for Equipment Leak Fugitives, dated October 2000. The emission factors are for total hydrocarbon, except for the emission factors associated with Water/Light Oil. As indicated on page 6 of 55 in the mentioned Guidance document, these factors are based off of a known stream constituency of 50%-99% water, and remainder VOC. Therefore, applying a VOC wt % would be double counting for the reduction due to water.

[b] Hourly VOC emission rates are calculated as follows:
(75 components) * (0.00992 lb/hr-component) * (40% VOC) * (100% - 0% reduction credit) = 0.30 lb/hr

[c] Annual VOC emission rates are calculated as follows:
(75 components) * (0.00992 lb/hr-component) * (8,760 hr/yr) * (40% VOC) * (100% - 0% reduction credit) / (2,000 lb/T) = 1.30 T/yr

CALCULATION OF HEATERS POTENTIAL TO EMIT

OIL & GAS STANDARD PERMIT REGISTRATION

DEWITT CENTRAL FACILITY 3

BURLINGTON RESOURCES OIL & GAS COMPANY LP

EPN	FIN	Description	Rated Duty (MMBtu/hr)	Operating Annual (hr/yr)	Pollutant	Emission Factor [a]	Unit	Potential To Emit [b] Hourly (lb/hr)	Potential To Emit [b] Annual (T/yr)
REB-1	REB-1	Glycol Reboiler No. 1	0.50	8,760	CO	84	lb/MMscf	0.04	0.18
					NO_x	100	lb/MMscf	0.05	0.22
					$PM/PM_{10}/PM_{2.5}$ [d]	7.6	lb/MMscf	0.004	0.02
					SO_2 [c]	10.0	ppm H2S	0.001	0.004
					VOC	5.5	lb/MMscf	0.003	0.01
					Benzene	0.0021	lb/MMscf	0.000001	0.000004
					CH_2O	0.075	lb/MMscf	0.00004	0.0002

[a] Unless otherwise noted, emission factors are from AP-42 Tables 1.4-1, 1.4-2, and 1.4-3 (dated 7/98) and are based on a fuel HHV of 1020 Btu/scf.

[b] Example calculations for EPN REB-1 follows:

CO (lb/hr) = (Rated Duty, MMBtu/hr)/(Higher Heating Value, Btu/scf)*(Emission Factor, lb/MMscf)

CO (lb/hr) = (0.50 MMBtu/hr)*) / (1020 Btu/scf) * (84 lb/MMscf)

= 0.04 lb/hr CO

CO (T/yr) = (Hourly Emissions, lb/hr)*(Annual Operating Hours, hr/yr)/(2,000 lb/T)

CO (T/yr) = (0.04 lb/hr)*(8,760 hr/yr)/(2,000 lb/T)

= 0.18 T/yr CO

[c] A material balance approach was used to estimate the SO_2 emission rates using the maximum sulfur concentration in the natural gas. H_2S Scavenger liquids are used to bring the fuel gas H_2S concentration below 10 ppm S.

SO_2 (lb/hr) = (Rated Duty, MMBtu/hr)/(Fuel Heating Value, Btu/scf)*(Sulfure, scf H2S/MMscf gas)*(1 lb-mol/379 scf)*(64.06 lb SO_2/lb-mol S)

SO_2 (lb/hr) = (0.50 MMBtu/hr)/(1448 Btu/scf)*(10.0 scf S/MMscf gas)*(1 lb-mol/379 scf)*(34.065 lb H2S/lb-mol)*(64.06 lb SO2/34.065 lb H2S)

= 0.001 lb/hr SO_2

[d] All PM is assumed to be less than 2.5 microns in diameter per footnote "c" of AP-42 Table 1.4-2.

GLYCOL DEHYDRATOR STILL VENT POTENTIAL TO EMIT

OIL & GAS STANDARD PERMIT REGISTRATION

DEWITT CENTRAL FACILITY 3

BURLINGTON RESOURCES OIL & GAS COMPANY LP

Component	Potential to Emit FIN DEHY-SV/EPN REB-1	
	Hourly (lb/hr)	Annual (T/yr)
Hydrogen Sulfide	0.0106	0.0468
Methane	0.9599	4.2042
Ethane	0.4138	1.8126
Propane	0.3256	1.4261
Isobutane	0.1101	0.4824
n-Butane	0.2012	0.8812
Isopentane	0.1053	0.4611
n-Pentane	0.0990	0.4339
n-Hexane	0.0546	0.2392
Cyclohexane	0.0421	0.1847
Other Hexanes	0.1030	0.4511
Heptanes	0.0515	0.2259
Benzene	0.0484	0.2123
Toluene	0.0830	0.3634
Ethylbenzene	0.0015	0.0066
Xylenes	0.0151	0.0661
C8+ Heavies	0.0194	0.0844
Total VOC	**1.2598**	**5.5184**

Note: The emissions from the pressurized flash tank and the condenser vent are routed to the reboiler, which will be running continuously with a 98% combustion efficiency. In the event that the reboiler can not handle the total volume of recycled gas to it, the remainder will be re-directed to flare with a 98% combustion efficiency. Accounting for both the max heater combustion and the max waste gas flare combustions is a built in conservative assumption such that both would not be running at max at the same time.

GRI-GLYCalc VERSION 4.0 - SUMMARY OF INPUT VALUES

Case Name: DEWITT CENTRAL FACILITY
File Name: T:\ConocoPhillips - 507\Templates\Central Facilities\GlyCalc run\DeWitt CF Dehy.ddf
Date: April 02, 2013

DESCRIPTION:

Description: Burlington Resources Dehy Unit

Annual Hours of Operation: 8760.0 hours/yr

WET GAS:

Temperature: 100.00 deg. F
Pressure: 1000.00 psig
Wet Gas Water Content: Saturated

Component	Conc. (vol %)
Carbon Dioxide	1.5470
Hydrogen Sulfide	0.0500
Nitrogen	0.0660
Methane	68.4160
Ethane	13.7110
Propane	6.9330
Isobutane	1.7130
n-Butane	2.9130
Isopentane	1.3010
n-Pentane	1.1500
n-Hexane	0.4920
Cyclohexane	0.1770
Other Hexanes	0.9950
Heptanes	0.3500
Benzene	0.0570
Toluene	0.0940
Ethylbenzene	0.0020
Xylenes	0.0190
C8+ Heavies	0.0640

DRY GAS:

Flow Rate: 30.0 MMSCF/day
Water Content: 7.0 lbs. H2O/MMSCF

LEAN GLYCOL:

Glycol Type: TEG
Water Content: 1.0 wt% H2O
Recirculation Ratio: 3.0 gal/lb H2O

PUMP:

Glycol Pump Type: Gas Injection
Gas Injection Pump Volume Ratio: 0.080 acfm gas/gpm glycol

FLASH TANK:

Flash Control: Combustion device
Flash Control Efficiency: 98.00 %
Temperature: 180.0 deg. F
Pressure: 35.0 psig

REGENERATOR OVERHEADS CONTROL DEVICE:

Control Device: Condenser
Temperature: 120.0 deg. F
Pressure: 14.0 psia

Control Device: Combustion Device
Destruction Efficiency: 98.0 %
Excess Oxygen: 0.0 %
Ambient Air Temperature: 80.0 deg. F

GRI-GLYCalc VERSION 4.0 - AGGREGATE CALCULATIONS REPORT

Case Name: DEWITT CENTRAL FACILITY
File Name: T:\ConocoPhillips - 507\Templates\Central Facilities\GlyCalc run\DeWitt CF Dehy.ddf
Date: April 02, 2013

DESCRIPTION:

Description: Burlington Resources Dehy Unit

Annual Hours of Operation: 8760.0 hours/yr

EMISSIONS REPORTS:

CONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Hydrogen Sulfide	0.0014	0.035	0.0063
Methane	0.0040	0.096	0.0175
Ethane	0.0049	0.118	0.0215
Propane	0.0068	0.164	0.0299
Isobutane	0.0026	0.063	0.0115
n-Butane	0.0053	0.127	0.0232
Isopentane	0.0018	0.044	0.0080
n-Pentane	0.0017	0.042	0.0076
n-Hexane	0.0008	0.020	0.0036
Cyclohexane	0.0016	0.039	0.0071
Other Hexanes	0.0016	0.039	0.0071
Heptanes	0.0005	0.013	0.0024
Benzene	0.0074	0.178	0.0325
Toluene	0.0072	0.172	0.0314
Ethylbenzene	0.0001	0.002	0.0003
Xylenes	0.0008	0.019	0.0034
C8+ Heavies	<0.0001	<0.001	<0.0001
Total Emissions	0.0487	1.168	0.2131
Total Hydrocarbon Emissions	0.0472	1.133	0.2068
Total VOC Emissions	0.0383	0.920	0.1679
Total HAP Emissions	0.0163	0.390	0.0712
Total BTEX Emissions	0.0154	0.370	0.0676

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Hydrogen Sulfide	0.0849	2.038	0.3720
Methane	0.2008	4.818	0.8793
Ethane	0.2554	6.130	1.1187
Propane	0.4125	9.899	1.8066
Isobutane	0.1870	4.487	0.8189
n-Butane	0.4245	10.188	1.8594
Isopentane	0.2352	5.645	1.0302
n-Pentane	0.2600	6.239	1.1387
n-Hexane	0.2308	5.539	1.0109
Cyclohexane	0.6241	14.978	2.7335
Other Hexanes	0.3361	8.065	1.4719
Heptanes	0.3937	9.448	1.7242
Benzene	3.7793	90.704	16.5534
Toluene	9.5940	230.255	42.0216
Ethylbenzene	0.2860	6.863	1.2526
Xylenes	3.9508	94.820	17.3047
C8+ Heavies	0.1622	3.892	0.7103
Total Emissions	21.4171	514.011	93.8069
Total Hydrocarbon Emissions	21.3322	511.972	93.4350
Total VOC Emissions	20.8760	501.024	91.4370
Total HAP Emissions	17.8409	428.182	78.1432
Total BTEX Emissions	17.6101	422.643	77.1323

FLASH GAS EMISSIONS

Component	lbs/hr	lbs/day	tons/yr

Hydrogen Sulfide	0.0092	0.222	0.0405
Methane	0.9559	22.941	4.1867
Ethane	0.4089	9.814	1.7911
Propane	0.3188	7.650	1.3962
Isobutane	0.1075	2.580	0.4709
n-Butane	0.1959	4.701	0.8580
Isopentane	0.1035	2.483	0.4531
n-Pentane	0.0973	2.336	0.4263
n-Hexane	0.0538	1.291	0.2356
Cyclohexane	0.0405	0.973	0.1776
Other Hexanes	0.1014	2.433	0.4440
Heptanes	0.0510	1.225	0.2235
Benzene	0.0410	0.985	0.1798
Toluene	0.0758	1.819	0.3320
Ethylbenzene	0.0014	0.035	0.0063
Xylenes	0.0143	0.343	0.0627
C8+ Heavies	0.0193	0.462	0.0844
Total Emissions	2.5956	62.294	11.3686
Total Hydrocarbon Emissions	2.5863	62.072	11.3281
Total VOC Emissions	1.2215	29.317	5.3503
Total HAP Emissions	0.1864	4.473	0.8163
Total BTEX Emissions	0.1326	3.182	0.5807

FLASH TANK OFF GAS

Component	lbs/hr	lbs/day	tons/yr
Hydrogen Sulfide	0.4623	11.096	2.0249
Methane	47.7938	1147.051	209.3368
Ethane	20.4463	490.712	89.5549
Propane	15.9385	382.524	69.8105
Isobutane	5.3751	129.003	23.5431
n-Butane	9.7943	235.063	42.8990
Isopentane	5.1728	124.148	22.6570
n-Pentane	4.8669	116.805	21.3169
n-Hexane	2.6891	64.537	11.7780
Cyclohexane	2.0271	48.651	8.8788
Other Hexanes	5.0683	121.639	22.1991
Heptanes	2.5518	61.242	11.1767
Benzene	2.0520	49.248	8.9878
Toluene	3.7897	90.952	16.5988
Ethylbenzene	0.0722	1.734	0.3164
Xylenes	0.7154	17.170	3.1335
C8+ Heavies	0.9632	23.118	4.2190
Total Emissions	129.7789	3114.693	568.4314
Total Hydrocarbon Emissions	129.3166	3103.597	566.4065
Total VOC Emissions	61.0764	1465.834	267.5148
Total HAP Emissions	9.3184	223.642	40.8146
Total BTEX Emissions	6.6294	159.105	29.0366

EQUIPMENT REPORTS:

CONDENSER AND COMBUSTION DEVICE

Condenser Outlet Temperature: 120.00 deg. F
Condenser Pressure: 14.00 psia
Condenser Duty: 9.40e-003 MM BTU/hr
Hydrocarbon Recovery: 1.53 bbls/day
Produced Water: 4.57 bbls/day
Ambient Temperature: 80.00 deg. F
Excess Oxygen: 0.00 %
Combustion Efficiency: 98.00 %
Supplemental Fuel Requirement: 9.40e-003 MM BTU/hr

Component	Emitted	Destroyed

Hydrogen Sulfide	1.70%	98.30%
Methane	1.99%	98.01%
Ethane	1.92%	98.08%
Propane	1.65%	98.35%
Isobutane	1.41%	98.59%
n-Butane	1.25%	98.75%
Isopentane	0.78%	99.22%
n-Pentane	0.67%	99.33%
n-Hexane	0.36%	99.64%
Cyclohexane	0.26%	99.74%
Other Hexanes	0.48%	99.52%
Heptanes	0.14%	99.86%
Benzene	0.20%	99.80%
Toluene	0.07%	99.93%
Ethylbenzene	0.02%	99.98%
Xylenes	0.02%	99.98%
C8+ Heavies	0.00%	100.00%

ABSORBER

NOTE: Because the Calculated Absorber Stages was below the minimum allowed, GRI-GLYCalc has set the number of Absorber Stages to 1.25 and has calculated a revised Dry Gas Dew Point.

Calculated Absorber Stages: 1.25
Calculated Dry Gas Dew Point: 3.83 lbs. H2O/MMSCF

Temperature: 100.0 deg. F
Pressure: 1000.0 psig
Dry Gas Flow Rate: 30.0000 MMSCF/day
Glycol Losses with Dry Gas: 2.3391 lb/hr
Wet Gas Water Content: Saturated
Calculated Wet Gas Water Content: 58.29 lbs. H2O/MMSCF
Specified Lean Glycol Recirc. Ratio: 3.00 gal/lb H2O

Component	Remaining in Dry Gas	Absorbed in Glycol
Water	6.56%	93.44%
Carbon Dioxide	99.84%	0.16%
Hydrogen Sulfide	99.14%	0.86%
Nitrogen	99.98%	0.02%
Methane	99.99%	0.01%
Ethane	99.97%	0.03%
Propane	99.96%	0.04%
Isobutane	99.95%	0.05%
n-Butane	99.94%	0.06%
Isopentane	99.94%	0.06%
n-Pentane	99.93%	0.07%
n-Hexane	99.91%	0.09%
Cyclohexane	99.58%	0.42%
Other Hexanes	99.93%	0.07%
Heptanes	99.86%	0.14%
Benzene	96.14%	3.86%
Toluene	95.43%	4.57%
Ethylbenzene	95.00%	5.00%
Xylenes	93.09%	6.91%
C8+ Heavies	99.81%	0.19%

FLASH TANK

Flash Control: Combustion device
Flash Control Efficiency: 98.00 %
Flash Temperature: 180.0 deg. F
Flash Pressure: 35.0 psig

Component	Left in Glycol	Removed in Flash Gas
Water	98.18%	1.82%
Carbon Dioxide	3.42%	96.58%
Hydrogen Sulfide	15.52%	84.48%

Nitrogen	0.41%	99.59%
Methane	0.42%	99.58%
Ethane	1.23%	98.77%
Propane	2.52%	97.48%
Isobutane	3.36%	96.64%
n-Butane	4.15%	95.85%
Isopentane	4.50%	95.50%
n-Pentane	5.24%	94.76%
n-Hexane	8.10%	91.90%
Cyclohexane	25.46%	74.54%
Other Hexanes	6.57%	93.43%
Heptanes	13.60%	86.40%
Benzene	66.52%	33.48%
Toluene	73.87%	26.13%
Ethylbenzene	81.89%	18.11%
Xylenes	86.63%	13.37%
C8+ Heavies	21.10%	78.90%

REGENERATOR

No Stripping Gas used in regenerator.

Component	Remaining in Glycol	Distilled Overhead
Water	21.28%	78.72%
Carbon Dioxide	0.00%	100.00%
Hydrogen Sulfide	0.00%	100.00%
Nitrogen	0.00%	100.00%
Methane	0.00%	100.00%
Ethane	0.00%	100.00%
Propane	0.00%	100.00%
Isobutane	0.00%	100.00%
n-Butane	0.00%	100.00%
Isopentane	3.55%	96.45%
n-Pentane	3.49%	96.51%
n-Hexane	2.66%	97.34%
Cyclohexane	9.87%	90.13%
Other Hexanes	5.77%	94.23%
Heptanes	1.96%	98.04%
Benzene	7.30%	92.70%
Toluene	10.45%	89.55%
Ethylbenzene	12.46%	87.54%
Xylenes	14.73%	85.27%
C8+ Heavies	37.02%	62.98%

STREAM REPORTS:

WET GAS STREAM

Temperature: 100.00 deg. F
Pressure: 1014.70 psia
Flow Rate: 1.25e+006 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	1.23e-001	7.30e+001
Carbon Dioxide	1.54e+000	2.24e+003
Hydrogen Sulfide	4.99e-002	5.61e+001
Nitrogen	6.59e-002	6.09e+001
Methane	6.83e+001	3.61e+004
Ethane	1.37e+001	1.36e+004
Propane	6.92e+000	1.01e+004
Isobutane	1.71e+000	3.28e+003
n-Butane	2.91e+000	5.58e+003
Isopentane	1.30e+000	3.09e+003
n-Pentane	1.15e+000	2.73e+003

n-Hexane	4.91e-001	1.40e+003
Cyclohexane	1.77e-001	4.91e+002
Other Hexanes	9.93e-001	2.82e+003
Heptanes	3.49e-001	1.16e+003
Benzene	5.69e-002	1.47e+002
Toluene	9.38e-002	2.85e+002
Ethylbenzene	2.00e-003	6.99e+000
Xylenes	1.90e-002	6.64e+001
C8+ Heavies	6.39e-002	3.59e+002
Total Components	100.00	8.36e+004

DRY GAS STREAM

Temperature: 100.00 deg. F
Pressure: 1014.70 psia
Flow Rate: 1.25e+006 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	8.07e-003	4.79e+000
Carbon Dioxide	1.54e+000	2.24e+003
Hydrogen Sulfide	4.96e-002	5.56e+001
Nitrogen	6.60e-002	6.09e+001
Methane	6.84e+001	3.61e+004
Ethane	1.37e+001	1.36e+004
Propane	6.93e+000	1.01e+004
Isobutane	1.71e+000	3.28e+003
n-Butane	2.91e+000	5.57e+003
Isopentane	1.30e+000	3.09e+003
n-Pentane	1.15e+000	2.73e+003
n-Hexane	4.91e-001	1.40e+003
Cyclohexane	1.76e-001	4.89e+002
Other Hexanes	9.94e-001	2.82e+003
Heptanes	3.49e-001	1.15e+003
Benzene	5.48e-002	1.41e+002
Toluene	8.97e-002	2.72e+002
Ethylbenzene	1.90e-003	6.64e+000
Xylenes	1.77e-002	6.19e+001
C8+ Heavies	6.39e-002	3.58e+002
Total Components	100.00	8.35e+004

LEAN GLYCOL STREAM

Temperature: 100.00 deg. F
Flow Rate: 3.20e+000 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.89e+001	1.78e+003
Water	1.00e+000	1.80e+001
Carbon Dioxide	1.94e-011	3.49e-010
Hydrogen Sulfide	2.67e-012	4.80e-011
Nitrogen	5.80e-014	1.04e-012
Methane	9.14e-018	1.65e-016
Ethane	1.18e-007	2.13e-006
Propane	9.82e-009	1.77e-007
Isobutane	2.75e-009	4.96e-008
n-Butane	4.92e-009	8.86e-008
Isopentane	4.80e-004	8.66e-003
n-Pentane	5.21e-004	9.39e-003
n-Hexane	3.50e-004	6.31e-003
Cyclohexane	3.79e-003	6.83e-002
Other Hexanes	1.14e-003	2.06e-002
Heptanes	4.38e-004	7.88e-003
Benzene	1.65e-002	2.98e-001
Toluene	6.21e-002	1.12e+000
Ethylbenzene	2.26e-003	4.07e-002
Xylenes	3.79e-002	6.83e-001
C8+ Heavies	5.29e-003	9.53e-002

Total Components	100.00	1.80e+003

RICH GLYCOL AND PUMP GAS STREAM

Temperature: 100.00 deg. F
Pressure: 1014.70 psia
Flow Rate: 3.68e+000 gpm
NOTE: Stream has more than one phase.

Component	Conc. (wt%)	Loading (lb/hr)
TEG	8.79e+001	1.78e+003
Water	4.26e+000	8.63e+001
Carbon Dioxide	3.04e-001	6.16e+000
Hydrogen Sulfide	2.70e-002	5.47e-001
Nitrogen	4.10e-003	8.30e-002
Methane	2.37e+000	4.80e+001
Ethane	1.02e+000	2.07e+001
Propane	8.07e-001	1.64e+001
Isobutane	2.74e-001	5.56e+000
n-Butane	5.04e-001	1.02e+001
Isopentane	2.67e-001	5.42e+000
n-Pentane	2.53e-001	5.14e+000
n-Hexane	1.44e-001	2.93e+000
Cyclohexane	1.34e-001	2.72e+000
Other Hexanes	2.68e-001	5.42e+000
Heptanes	1.46e-001	2.95e+000
Benzene	3.02e-001	6.13e+000
Toluene	7.16e-001	1.45e+001
Ethylbenzene	1.97e-002	3.99e-001
Xylenes	2.64e-001	5.35e+000
C8+ Heavies	6.02e-002	1.22e+000
Total Components	100.00	2.03e+003

FLASH TANK OFF GAS STREAM

Temperature: 180.00 deg. F
Pressure: 49.70 psia
Flow Rate: 1.85e+003 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	1.79e+000	1.57e+000
Carbon Dioxide	2.77e+000	5.95e+000
Hydrogen Sulfide	2.78e-001	4.62e-001
Nitrogen	6.05e-002	8.27e-002
Methane	6.11e+001	4.78e+001
Ethane	1.39e+001	2.04e+001
Propane	7.41e+000	1.59e+001
Isobutane	1.90e+000	5.38e+000
n-Butane	3.45e+000	9.79e+000
Isopentane	1.47e+000	5.17e+000
n-Pentane	1.38e+000	4.87e+000
n-Hexane	6.39e-001	2.69e+000
Cyclohexane	4.94e-001	2.03e+000
Other Hexanes	1.21e+000	5.07e+000
Heptanes	5.22e-001	2.55e+000
Benzene	5.38e-001	2.05e+000
Toluene	8.43e-001	3.79e+000
Ethylbenzene	1.39e-002	7.22e-002
Xylenes	1.38e-001	7.15e-001
C8+ Heavies	1.16e-001	9.63e-001
Total Components	100.00	1.37e+002

FLASH TANK GLYCOL STREAM

Temperature: 180.00 deg. F

Flow Rate: 3.38e+000 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.42e+001	1.78e+003
Water	4.49e+000	8.47e+001
Carbon Dioxide	1.11e-002	2.11e-001
Hydrogen Sulfide	4.50e-003	8.49e-002
Nitrogen	1.80e-005	3.39e-004
Methane	1.06e-002	2.01e-001
Ethane	1.35e-002	2.55e-001
Propane	2.18e-002	4.12e-001
Isobutane	9.90e-003	1.87e-001
n-Butane	2.25e-002	4.25e-001
Isopentane	1.29e-002	2.44e-001
n-Pentane	1.43e-002	2.69e-001
n-Hexane	1.26e-002	2.37e-001
Cyclohexane	3.67e-002	6.92e-001
Other Hexanes	1.89e-002	3.57e-001
Heptanes	2.13e-002	4.02e-001
Benzene	2.16e-001	4.08e+000
Toluene	5.67e-001	1.07e+001
Ethylbenzene	1.73e-002	3.27e-001
Xylenes	2.45e-001	4.63e+000
C8+ Heavies	1.36e-002	2.58e-001
Total Components	100.00	1.89e+003

FLASH GAS EMISSIONS

Flow Rate: 8.13e+003 scfh
Control Method: Combustion Device
Control Efficiency: 98.00

Component	Conc. (vol%)	Loading (lb/hr)
Water	5.96e+001	2.30e+002
Carbon Dioxide	4.00e+001	3.77e+002
Hydrogen Sulfide	1.27e-003	9.25e 003
Nitrogen	1.38e-002	8.27e-002
Methane	2.78e-001	9.56e-001
Ethane	6.35e-002	4.09e-001
Propane	3.37e-002	3.19e-001
Isobutane	8.64e-003	1.08e-001
n-Butane	1.57e-002	1.96e-001
Isopentane	6.70e-003	1.03e-001
n-Pentane	6.30e-003	9.73e-002
n-Hexane	2.91e-003	5.38e-002
Cyclohexane	2.25e-003	4.05e-002
Other Hexanes	5.49e-003	1.01e-001
Heptanes	2.38e-003	5.10e-002
Benzene	2.45e-003	4.10e-002
Toluene	3.84e-003	7.58e-002
Ethylbenzene	6.35e-0D5	1.44e-003
Xylenes	6.29e-004	1.43e-002
C8+ Heavies	5.28e-004	1.93e-002
Total Components	100.00	6.09e+D02

REGENERATOR OVERHEADS STREAM

Temperature: 212.00 deg. F
Pressure: 14.70 psia
Flow Rate: 1.51e+003 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	9.33e+001	6.67e+001
Carbon Dioxide	1.21e-001	2.11e-001
Hydrogen Sulfide	6.28e-002	8.49e-002
Nitrogen	3.05e-004	3.39e-004

Methane	3.15e-001	2.01e-001
Ethane	2.14e-001	2.55e-001
Propane	2.36e-001	4.12e-001
Isobutane	8.10e-002	1.87e-001
n-Butane	1.84e-001	4.25e-001
Isopentane	8.21e-002	2.35e-001
n Pentane	9.08e 002	2.60e 001
n-Hexane	6.75e-002	2.31e-001
Cyclohexane	1.87e-001	6.24e-001
Other Hexanes	9.82e-002	3.36e-001
Heptanes	9.89e-002	3.94e-001
Benzene	1.22e+000	3.78e+000
Toluene	2.62e+000	9.59e+000
Ethylbenzene	6.78e-002	2.86e-001
Xylenes	9.37e-001	3.95e+000
C8+ Heavies	2.40e-002	1.62e-001
Total Components	100.00	8.83e+001

CONDENSER PRODUCED WATER STREAM

Temperature: 120.00 deg. F
Flow Rate: 1.33e-001 gpm

Component	Conc. (wt%)	Loading (lb/hr)	(ppm)
Water	9.99e+001	6.66e+001	998956.
Carbon Dioxide	6.01e-003	4.00e-003	60.
Hydrogen Sulfide	7.04e-003	4.69e-003	70.
Nitrogen	2.59e-007	1.72e-007	0.
Methane	2.99e-004	1.99e-004	3.
Ethane	4.19e-004	2.79e-004	4.
Propane	6.01e-004	4.00e-004	6.
Isobutane	1.26e-004	8.40e-005	1.
n-Butane	3.37e-004	2.25e-004	3.
Isopentane	8.21e-005	5.47e-005	1.
n-Pentane	8.40e-005	5.59e-005	1.
n-Hexane	3.28e-005	2.18e-005	0.
Cyclohexane	3.63e-004	2.42e-004	4.
Other Hexanes	5.19e-005	3.46e-005	1.
Heptanes	1.21e-005	8.04e-006	0.
Benzene	4.70e-002	3.13e-002	470.
Toluene	3.74e-002	2.49e-002	374.
Ethylbenzene	2.74e-004	1.82e-004	3.
Xylenes	4.22e-003	2.81e-003	42.
C8+ Heavies	8.02e-009	5.34e-009	0.
Total Components	100.00	6.66e+001	1000000.

CONDENSER RECOVERED OIL STREAM

Temperature: 120.00 deg. F
Flow Rate: 4.45e-002 gpm

Component	Conc. (wt%)	Loading (lb/hr)
Water	6.19e-002	1.17e-002
Carbon Dioxide	2.78e-002	5.26e-003
Hydrogen Sulfide	4.32e-002	8.18e-003
Nitrogen	3.70e-005	7.01e-006
Methane	6.90e-003	1.31e-003
Ethane	5.30e-002	1.00e-002
Propane	3.76e-001	7.12e-002
Isobutane	2.93e-001	5.55e-002
n-Butane	8.45e-001	1.60e-001
Isopentane	7.59e-001	1.44e-001
n-Pentane	9.12e-001	1.73e-001
n-Hexane	1.00e+000	1.90e-001
Cyclohexane	2.87e+000	5.43e-001
Other Hexanes	1.35e+000	2.55e-001
Heptanes	1.93e+000	3.66e-001

Benzene	1.78e+001	3.38e+000
Toluene	4.86e+001	9.21e+000
Ethylbenzene	1.49e+000	2.82e-001
Xylenes	2.06e+001	3.91e+000
C8+ Heavies	8.56e-001	1.62e-001
Total Components	100.00	1.89e+001

CONDENSER VENT STREAM

Temperature: 120.00 deg. F
Pressure: 14.00 psia
Flow Rate: 2.42e+001 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	1.22e+001	1.40e-001
Carbon Dioxide	7.18e+000	2.01e-001
Hydrogen Sulfide	3.32e+000	7.21e-002
Nitrogen	1.86e-002	3.32e-004
Methane	1.95e+001	1.99e-001
Ethane	1.28e+001	2.45e-001
Propane	1.21e+001	3.41e-001
Isobutane	3.55e+000	1.31e-001
n-Butane	7.14e+000	2.64e-001
Isopentane	1.99e+000	9.14e 002
n-Pentane	1.90e+000	8.72e-002
n-Hexane	7.47e-001	4.10e-002
Cyclohexane	1.50e+000	8.06e-002
Other Hexanes	1.47e+000	8.06e-002
Heptanes	4.27e-001	2.73e-002
Benzene	7.44e+000	3.71e-001
Toluene	6.11e+000	3.59e-001
Ethylbenzene	5.14e-002	3.48e-003
Xylenes	5.72e-001	3.87e-002
C8+ Heavies	2.64e-004	2.87e-005
Total Components	100.00	2.77e+000

COMBUSTION DEVICE OFF GAS STREAM

Temperature: 1000.00 deg. F
Pressure: 14.70 psia
Flow Rate: 3.90e-001 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Hydrogen Sulfide	4.11e+000	1.44e-003
Methane	2.42e+001	3.99e-003
Ethane	1.59e+001	4.90e-003
Propane	1.50e+001	6.82e-003
Isobutane	4.40e+000	2.63e-003
n-Butane	8.85e+000	5.29e-003
Isopentane	2.46e+000	1.83e-003
n-Pentane	2.35e+000	1.74e-003
n-Hexane	9.26e-001	8.20e-004
Cyclohexane	1.86e+000	1.61e-003
Other Hexanes	1.82e+000	1.61e-003
Heptanes	5.29e-001	5.45e-004
Benzene	9.23e+000	7.41e-003
Toluene	7.58e+000	7.18e-003
Ethylbenzene	6.38e-002	6.96e-005
Xylenes	7.09e-001	7.74e-004
C8+ Heavies	3.28e-004	5.73e-007
Total Components	100.00	4.87e-002
Total Components	100.00	4.67e-002

SUMMARY OF TANKS SENT TO FLARE POTENTIAL TO EMIT

OIL & GAS STANDARD PERMIT REGISTRATION

DEWITT CENTRAL FACILITY 3

BURLINGTON RESOURCES OIL & GAS COMPANY LP

			VOC Emissions								Benzene Emissions								H_2S Emissions[c]			
			Flash Emissions[a]		WB Emissions[b]		Uncontrolled Total		Controlled Total[d]		Flash Emissions[a]		WB Emissions[b]		Uncontrolled Total		Controlled Total[d]		Uncontrolled Total		Controlled Total[d]	
EPN	FIN	Description	Hourly (lb/hr)	Annual (T/yr)	Hourly (lb/hr)	Annual (T/yr)	Hourly (lb/hr)	Annual (T/yr)	Hourly (lb/hr)	Annual (T/yr)	Hourly (lb/hr)	Annual (T/yr)	Hourly (lb/hr)	Annual (T/yr)	Hourly (lb/hr)	Annual (T/yr)	Hourly (lb/hr)	Annual (T/yr)	Hourly (lb/hr)	Annual (T/yr)	Hourly (lb/hr)	Annual (T/yr)
FL-1	TK-01 TK-02	500 bbl Coodensate Storage Tanks	100.34	439.49	22.03	14.10	122.37	453.59	2.45	9.07	0.36	1.58	0.22	0.14	0.58	1.72	0.01	0.03	0.06	0.26	0.001	0.01
FL-1	TK-03	500 bbl Slop Storage Tank	--	--	11.02	1.85	11.02	1.85	0.22	0.04	--	--	0.11	0.02	0.11	0.02	0.002	0.0004	--	--	--	--
FL-1	TK-04	500 bbl Produced Water Storage Tank	2.73	11.96	0.11	0.03	2.84	11.99	0.06	0.24	0.01	0.04	0.001	0.0002	0.01	0.04	0.0002	0.001	0.002	0.01	0.00004	0.0002
TK-AF[e]	TK-AF[e]	Antifreeze Liquid Storage	--	--	0.50	0.01	0.50	0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TK-LO[e]	TK-LO[e]	Lube Oil Liquid Storage	--	--	0.0002	0.000002	0.0002	0.000002	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TK-SCAV[f]	TK-SCAV[f]	H_2S Scavenger Liquid Storage	--	--	--	--	<0.01	<0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

[a] VOC and Benzene Flash Emissions are calculated using the WinSim stream simulation program. Data inputs included the pressurized stream data and throughputs represented in this submittal. See the pages at the end of this attachment for a printout of the data inputs and emissions reports.

[b] The Working/Breathing emissions for tanks TK-01 thourgh TK-04 are calculated using AP 42 Chapter 7 calculations with data inputs from the stream data and throughputs. See the following pages for the represented calculations.

[c] The Ideal Gas Law was used to estimate the H2S emission rates using the maximum sulfur concentration in the gas coming off the tanks (500 ppm). An example calculation for hourly H2S emissions from FIN TK-04 follows:

H_2S (lb/hr) = (% Vol H_2S in stream) * (Total Volumetric Flow of Gas, scf/hr) * (1 atm STP) * (34.0798 lb/lb-mol H2S) / (1.314, atm-scf/lb-mol-K) / (298 K)

H_2S (lb/hr) = (500 ppm /10^6) * (35.66 scf/hr) * (1 atm) * (34.0789 lb/lbmol H2S) / (1.314, atm-scf/lb-mol-K) / (298 K)

H_2S (lb/hr) = 0.002 lb/hr

[d] All VOC tank emissions are routed to the flare control device with a capture and control efficiency of 98%. H_2S emissions are captured at 98% and then 98% converted to SO_2 during combustion.

[e] Working and breathing emissions for the Antifreeze and Lube Oil tanks were determined using Tanks 4.09d simulation software. The size and number of TK-AF and TK-LO tanks may vary, but the total throughput of the liquid and the associated VOC emissions will not exceed the proposed emission rate. Printouts from the software can be found on the following pages. An example calculation of the hourly emissions for FIN TK-AF follows:

VOC(lb/hr)= [((Breathing Loss, lb/yr) / (8.760 hr/yr)) + ((Working Loss, lb/yr) / (Number of turnovers/yr) / (Turnovers per hour))] * No. of tanks

VOC(lb/hr)= ((8.909 lb/yr) / (8.760 hr/yr)) + ((5.9832 lb/yr) / (12 turnovers/yr) / (1 turnover per hour))

VOC(lb/hr)= 0.50 lb/hr

An example calculation of the annual emissions for FIN TK-AF follows:

VOC(T/yr)= ((Working Loss, lb/yr) + (Breathing Loss, lb/yr)) / (2.000 ton/yr)) * No. of Tanks

VOC(T/yr)= ((5.9832 lb/yr) + (8.909 lb/yr)) / (2.000 ton/yr)

VOC(T/yr)= 0.01 lb/hr

[f] The size and number of the H_2S Scavenger Liquid Storage Tanks may vary, but the total throughput of the liquid and the associated VOC emissions will not exceed the proposed negligible emission rate.

CALCULATION OF STORAGE TANK WORKING AND BREATHING POTENTIAL TO EMIT

OIL & GAS STANDARD PERMIT REGISTRATION

DEWITT CENTRAL FACILITY 3

BURLINGTON RESOURCES OIL & GAS COMPANY LP

Variable	Description	Units	Value
L_T	total loss = Ls + Lw	Ton/yr	See Table
L_S	standing loss = 365 Vv Wv Ke Ks	lb/yr	See Table
L_W	working loss = 0.001 Mv Pv Q Kn Kp	lb/yr	See Table
L_H	working loss = 0.001 Mv Pmax Qh	lb/hr	See Table
	Roof Construction		Cone
RVP	Condensate Reid Vapor Pressure	psia	13.77
ΔPb	Breather vent pressure range	psi	0.06
I	Solar insolation factor	Btu/ft2-day	1521
P_A	Atmospheric Pressure	psia	14.7
Mv	Vapor Molecular Weight	lb/lb-mol	40
T	Annual Averege Temperature	°F	72.1
T_{AX}	Daily Maximum Ambient Temperature	°R	541.6
T_{AN}	Daily Minimum Ambient Temperature	°R	522.5
ΔT_A	Daily average ambient temperature range	°R	19.1
Kp	Product factor		1

		Tank Specifications							Material Specifications															VOC		Benzene	
		V/H	D	H/L	Capacity	Color		α	Mv	P_{MAX}	Q		ΔTv	Hvo	Vv	T_{LA}	P_{VA}	Wv	ΔPv	Ke	Ks	Kn	L_S	L_W	L_T	L_H	L_T	L_H
Material	No. of Tanks	Tank Type	Tank Diameter (ft)	Tank Height/ Length (ft)	Tank Capacity (bbl)	Paint Color	Paint Conditions	Paint Solar Absorbance Factor	Vapor Molecular Weight	Reid Vapor Pressure (psia)	Max. Hourly Thruput (bbl/hr)	Annual thruput (bbl)	Daily Vapor Temp. Range °F	Vapor Space Outage (ft)	Vapor Space Volume (ft3)	Daily Average Liquid Surface Temp °R	Average Vapor Pressure (psia)	Vapor Density (lb/ft3)	Daily Vapor Pressure Range	Vapor Space Expan. Factor	Vented Vapor Sat. Factor	Turnover Factor	Standing Loss per tank (lb/yr)	Working Loss per tank (lb/yr)	Total Loss (lb/hr)	Total Loss (T/yr)	Total Loss (lb/hr)	Total Loss (T/yr)
Condensate	2	V	12	25	500	Gray	Good	0.54	40	13.77	40	182,500	36.75	12.63	1428.4	539.8	15.456	0.10673	3.96891	-5.1024	0.09	0.25	0.00	28,207.20	**22.03**	**14.10**	**0.22**	**0.14**
Slop	1	V	12	25	500	Gray	Good	0.54	40	13.77	20	6,000	36.75	12.63	1428.4	539.8	15.456	0.10673	3.96891	-5.1024	0.09	1.00	0.00	3,709.44	**11.02**	**1.85**	**0.11**	**0.02**
PW	1	V	12	25	500	Gray	Good	0.54	40	0.138	20	73,000	36.75	12.63	1428.4	539.8	0.042	0.00029	0.02561	0.0662	0.97	0.37	9.71	45.38	**0.11**	**0.03**	**0.001**	**0.0002**

NOTE: Tank working and breathing emissions are based on the equations found in EPA AP 42 Chapter 7. All factors used are represented in the table on this page. The Condensate Reid Vapor Pressure and Vapor Molecular Weight are determined based on the WinSim condensate stream and Off Gas stream. All other variables are found in AP 42 Chapter 7 or are default unit values.

CALCULATION OF TRUCK LOADING POTENTIAL TO EMIT

OIL & GAS STANDARD PERMIT REGISTRATION

DEWITT CENTRAL FACILITY 3

BURLINGTON RESOURCES OIL & GAS COMPANY LP

Sample Calculations for condensate and slop:

Loading Loss (lb/Mgal) = 12.46 * S * P * M / T (AP-42 Section 5.2)
Maximum Loading Loss = 12.46 * 0.60 * 13.770 * 40 / 560 = 7.353 lb/Mgal

Hourly Uncollected Emissions PTE = (Hourly Throughput, Mgal/hr) * (Maximum Loading Loss, lb/Mgal) * (1 - Capture Efficiency
Hourly Uncollected Emissions PTE = (8.19 Mgal/hr) * (7.353 lb/Mgal) * (1 - 0.987) = 0.78 lb/h

Hourly PTE = ((Hourly Throughput, Mgal/hr) * (Maximum Loading Loss, lb/Mgal) * (Capture Efficiency) * (1 - Control Efficiency)) + (Hourly Uncollected Loading Emissions, (lb/hr
Hourly PTE = (8.19 Mgal/hr) * (7.353 lb/Mgal) * (0.987) * (1 - 0.98) + (0.78 lb/hr) = 1.97 lb/h

Annual Emissions = ((Annual Throughput, Mgal/yr) * (Average Loading Loss, lb/Mgal) * (Capture Efficiency) * (1 - Control Efficiency)) + (Annual Uncollected Loading Emissions, lb/yr)) / (2000 lb/
Annual Emissions = (7917.00 Mgal/yr) * (7.367 lb/Mgal) * (0.987) * (1 - 0.98) + (758.22 lb/yr) / (2000 lb/T) = 0.95 T/y

														VOC		Benzene	
FIN	EPN	Facility Name	S	P @ 560 °R (psia)	P @531.7 °R (psia)	M	Maximum Loading Loss (lb/Mgal)	Average Loading Loss (lb/Mgal)	Hourly Throughput (Mgal/hr)	Annual Throughput (Mgals/yr)	Capture Efficiency	Hourly Uncollected Loading Emissions (lb/hr)	Annual Uncollected Loading Emissions (lb/yr))	Control Efficiency	Hourly PTE (lb/hr)	Annual PTE (T/yr)	Hourly PTE (lb/hr)	Annual PTE (T/yr)
TRUCK1	FL-1	Condensate and Slop Tank Truck Loading	0.60	13.77	13.099	40	7.353	7.367	8.19	7,917.00	0.987	0.78	758.22	0.98	1.97	0.95	0.02	0.01
TRUCK2	FL-1	Produced Water Tank Truck Loading	0.60	0.14	0.029	40	0.075	0.079	8.19	3,066.00	0.987	0.01	3.15	0.98	0.02	0.004	0.0001	0.00002

Daily maximum and daily minimum ambient temperature from Tanks 4.09d for this area's annual averages (79.5and 57.725, for average of 68.62).

Annual Average Condensate Vapor Pressure at T_{LA}:
P = exp{ [(2799/(T+459.6) - 2.227]log10(RVP) - 7261/(T+459.6) + 12.82}
exp{ [(2799/(68.62+459.6) - 2.227]log10(13.77) - 7261/(68.62+459.6) + 12.82}
13.099 psia

Annual Average Produced Water Vapor Pressure at T_{LA}:
P = exp{ [(2799/(T+459.6) - 2.227]log10(RVP) - 7261/(T+459.6) + 12.82}
exp{ [(2799/(68.62+459.6) - 2.227]log10(13.77*.01) - 7261/(68.62+459.6) + 12.82}
0.029 psia

NOTE: Capture Efficiency of 98.7% represented based upon TCEQ Guidance regarding trucks that are utlizing NSPS XX Testing

SUMMARY OF PROCESS FLARE FUEL GAS COMBUSTION AND WASTE GAS COMBUSTION POTENTIAL TO EMIT- NORMAL OPERATIONS

OIL & GAS STANDARD PERMIT REGISTRATION

DEWITT CENTRAL FACILITY 3

BURLINGTON RESOURCES OIL & GAS COMPANY LP

EPN	FIN	Description	CO		NO_X		SO_2		H_2S		VOC		Benzene	
			(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)
FL-1	FL-1	Pilot Gas Combustion	0.01	0.04	0.003	0.01	0.001	0.004	0.0000004	0.000002	0.0001	0.0004	0.00000003	0.0000001
FL-1	FL-1	Flare Assist Gas Combustion	0.44	1.93	0.22	0.96	0.10	0.44	0.00003	0.0001	0.01	0.04	0.000003	0.00001
FL-1	FL-1	Waste Gas Combustion	2.32	7.25	1.16	3.63	0.13	0.57	0.001	0.01	--	--	--	--
		Totals:	**2.77**	**9.22**	**1.38**	**4.60**	**0.23**	**1.01**	**0.001**	**0.01**	**0.01**	**0.04**	**0.000003**	**0.00001**

NOTE: Pilot Gas Combustion and Flare Assist Gas Combustion calculations are shown on the following page. Waste Gas Combustion shown here is the combined sum of the waste gas from the Dehy waste stream, Condensate and Produced Water tanks, and loading operations shown on subsequent pages.

CALCULATION OF FLARE PILOT GAS and FLARE ASSIST GAS POTENTIAL TO EMIT

OIL & GAS STANDARD PERMIT REGISTRATION

DEWITT CENTRAL FACILITY 3

BURLINGTON RESOURCES OIL & GAS COMPANY LP

EPN	FIN	Description	LHV (Btu/scf)	Heat Release scf/hr	Operating Hours (hr/yr)	Pollutant	Emission Factors	Units	Emission Rates Hourly [a] (lb/hr)	Emission Rates Annual [b] (T/yr)
FL-1	FL-1	Flare 1- Process Pilot Gas Combustion	1,292	15	8,760	CO	0.2755	lb/MMBtu	0.01	0.04
						NO_X	0.138	lb/MMBtu	0.003	0.01
						$PM/PM_{10}/PM_{2.5}$	-- [c]	--	--	--
						SO_2	500	ppm H_2S	0.001	0.004
						H_2S	500	ppm H_2S	0.0000004	0.000002
						VOC	5.5	lb/MMscf	0.0001	0.0004
						Benzene	0.0021	lb/MMscf	0.00000003	0.0000001
FL-1	FL-1	Flare 1- Process Flare Assist Gas Combustion	1,292	1,250	8,760	CO	0.2755	lb/MMBtu	0.44	1.93
						NO_X	0.138	lb/MMBtu	0.22	0.96
						$PM/PM_{10}/PM_{2.5}$	-- [c]	--	--	--
						SO_2	500	ppm H_2S	0.10	0.44
						H_2S	500	ppm H_2S	0.00003	0.0001
						VOC	5.5	lb/MMscf	0.01	0.04
						Benzene	0.0021	lb/MMscf	0.000003	0.00001

[a] Emission Factors for CO and NO_X are based upon the Draft TNRCC Guidance Document for Flares and Vapor Oxidizers (dated 10/00) for other high-Btu flares. An example calculation for hourly CO emissions for EPN FL-1 follows:

CO (lb/hr) = (Heat Release, scf/hr) * (Lower Heating Value, Btu/scf) * (MM/10^6)*(Emission Factor, lb/MMBtu)

CO (lb/hr) = (15 scf/hr) * (1,292 Btu/scf) * (MM/10^6)*(0.2755 lb/MMBtu)

= 0.01 lb/hr CO

The Emission Factors for VOC and Benzene were based upon AP-42 Table 1.4-2 and 1.4-3 (dated 7/98). An example calculation for hourly VOC emissions for EPN FL-1 follows:

VOC (lb/hr) = (Heat Release, scf/hr) * (MM/10^6) * (Emission Factor, lb/MMscf)

VOC (lb/hr) = (15 scf/hr) * (MM/10^6) * (5.5 lb/MMscf)

= 0.0001 lb/hr VOC

A material balance approach was used to estimate the SO2 and H2S emission rates using the maximum sulfur concentration in the natural gas. As shown in Figure 6-1, H2S concentration at the site is conservatively represented at 500 ppm. When used as a pilot gas or flare assist gas, 98% of this concentration will be converted to SO2, and 2% will remain uncombusted and unconverted. An example calculation for hourly SO2 emissions for the pilot gas of EPN FL-01 follows:

SO_2 (lb/hr) = Heat Release (scf/hr)*(Sulfur Content, ppmv)*(98% conversion to SO_2)*(1 lb-mol/379 scf)*(34.065 lb H2S/lb-mol)*(64.06 lb SO_2/34.065 lb H2S)

SO_2 (lb/hr) = (15 scf/hr)*((500 ppm H2S)/(10^6 scf gas))*(98% converted to SO2)*(1 lb-mol/379 scf)*(34.065 lb H2S/lb-mol)*(64.06 lb SO2/34.065 lb H2S)

= 0.0010 lb/hr SO_2

[b] An example calculation for annual CO emissions for EPN FL-1 follows:

CO (T/yr) = (Hourly Emissions, lb/hr)*(Annual Operating Hours, hr/yr)*(1 T/2,000 lb)

CO (T/yr) = (0.01 lb/hr)*(8,760 hr/yr)*(1 T/2,000 lb)

CO (T/yr) = 0.04 T/yr CO

[c] The process flares are smokeless per 40 CFR §60.18 requirements; therefore, PM emissions are negligible.

PROCESS FLARE WASTE GAS COMBUSTION EMISSIONS

OIL & GAS STANDARD PERMIT REGISTRATION

DEWITT CENTRAL FACILITY 3

BURLINGTON RESOURCES OIL & GAS COMPANY LP

EPN	FIN	Description	LHV[a] (Btu/scf)	Waste Gas Flow Rate Hourly (MMBtu/hr)	Waste Gas Flow Rate Annual (MMBtu/yr)	Pollutant	Emission Factors	Units	Potential to Emit Hourly[b] (lb/hr)	Potential to Emit Annual[c] (T/yr)
FL-1	FL-1	Process Flare	2,088	5.63	28,280.86	CO	0.2755	lb/MMBtu	1.55	3.90
		Condensate Tanks and Loading				NO_X	0.1380	lb/MMBtu	0.78	1.95
						$PM/PM_{10}/PM_{2.5}$	-- [e]	--	--	--
						SO_2	-- [c]	--	0.11	0.47
						H_2S	--	--	0.001	0.005
FL-1	FL-1	Process Flare	2,061	0.10	703.27	CO	0.2755	lb/MMBtu	0.03	0.10
		Produced Water Tank and Loading				NO_X	0.1380	lb/MMBtu	0.01	0.05
						$PM/PM_{10}/PM_{2.5}$	-- [e]	--	--	--
						SO_2	-- [c]	--	0.004	0.02
						H_2S	--	--	0.00004	0.0002
FL-1	FL-1	Process Flare	1,436	2.69	23,564.40	CO	0.2755	lb/MMBtu	0.74	3.25
		Dehy Unit Waste Gas				NO_X	0.1380	lb/MMBtu	0.37	1.63
						$PM/PM_{10}/PM_{2.5}$	-- [e]	--	--	--
						SO_2	-- [c]	--	0.02	0.08
						H_2S	--	--	0.0002	0.001

[a] Waste gas stream lower heating value was taken from WinSim calculated stream value.

[b] Emission Factors for CO and NO_X are based upon the Draft TNRCC Guidance Document for Flares and Vapor Oxidizers (dated 10/00) for other high-Btu flares. An example calculation for hourly CO emissions for EPN Fl-1 follows:

CO (lb/hr) = (Hourly Waste Gas Flow Rate, MMBtu/hr)*(Emission Factor, lb/MMBtu)

CO (lb/hr) = (5.63 MMBtu/hr)*(0.2755 lb/MMBtu)

= 1.55 lb/hr CO

[c] H_2S emissions are routed from the tanks to the flare and from the seperator to the flare and then converted to SO_2. SO_2 emission rates were determined based on the combustion efficiency of 98% H_2S converted to SO_2. H_2S emitted at the flare is 2% of the stream not converted by combustion. An example calculation for hourly SO_2 emissions for EPN FL-1 follows:

SO_2 (lb/hr) = (Source H_2S Emission Rate, lb/hr) * (98% captured H2S stream) * (98% conversion to SO_2 at combustion) * (1 mol H_2S/34.07 lb H_2S) * (64.06 lb SO2/1 mol SO_2)

SO_2 (lb/hr) = (0.06 lb/hr H2S at Condensate Tanks)* (98%) * (98%) * (1 mol H2S/34.07 lb H2S) * (64.06 lb SO2/1 mol SO2)

= 0.11 lb/hr SO_2

[d] An example calculation for annual CO emissions for EPN FL-1 follows:

CO (T/yr) = (Annual Waste Gas Flow Rate, MMBtu/yr) * (Emission Factor, lb/MMBtu) * (1 T / 2,000 lb)

CO (T/yr) = (28,280.86 MMBtu/yr) * (0.2755 lb/MMBtu) * (1 T / 2,000 lb)

= 3.90 T/yr CO

[e] The process flares are smokeless per 40 CFR §60.18 requirements; therefore, PM emissions are negligible.

CALCULATION OF FLARE FEED RATES FROM FINs TK-01 THROUGH TK-03, and TRUCK1

OIL & GAS STANDARD PERMIT REGISTRATION

DEWITT CENTRAL FACILITY 3

BURLINGTON RESOURCES OIL & GAS COMPANY LP

TK-01 through TK-03 and TRUCK1 Total Emissions:[a]

VOC Emissions (lb/hr): 192.89
VOC Emissions (TPY): 483.98
Hydrocarbon Emissions (lb/hr): 268.95
Hydrocarbon Emissions (TPY): 674.82

Constituent	Heating Value[b] (Btu/lb)	Condensate Tanks Flash Gas Weight (%)	TK-01 through TK-03 and TRUCK1 Emissions[c] Hourly (lb/hr)	TK-01 through TK-03 and TRUCK1 Emissions[c] Annual (T/yr)	Flare Feed Rate[d] Hourly (MMBtu/hr)	Flare Feed Rate[d] Annual (MMBtu/yr)
Methane	23,861	11.82%	31.79	79.76	0.74	3,730.18
Ethane	22,304	14.97%	40.26	101.02	0.88	4,416.17
Propane	21,646	20.07%	53.98	135.44	1.15	5,746.20
I-Butane	21,242	7.76%	20.87	52.37	0.43	2,180.39
N-Butane	21,293	14.66%	39.43	98.93	0.82	4,128.77
I-Pentane	21,025	8.47%	22.78	57.16	0.47	2,355.51
N-Pentane	21,072	8.35%	22.46	56.35	0.46	2,327.32
Cyclopentane	20,350	0.00%	0.00	0.00	0.00	0.00
n-Hexane	20,928	7.23%	19.45	48.79	0.40	2,001.31
Cyclohexane	20,195	0.51%	1.37	3.44	0.03	136.16
Other Hexanes	20,928	0.00%	0.00	0.00	0.00	0.00
Heptanes	20,825	3.15%	8.47	21.26	0.17	867.77
Octanes	20,747	0.60%	1.61	4.05	0.03	164.69
Nonanes	20,687	0.08%	0.22	0.54	0.004	21.90
Decanes Plus	20,638	0.03%	0.08	0.20	0.002	8.09
Benzene	18,172	0.26%	0.70	1.75	0.01	62.33
Toluene	18,422	0.40%	1.08	2.70	0.02	97.49
Ethylbenzene	18,658	0.03%	0.08	0.20	0.001	7.31
Xylene	18,438	0.12%	0.32	0.81	0.01	29.27
	VOC	71.72%				
				Total:	**5.63**	**28,280.86**

[a] Total VOC Emissions were determined by adding the Uncontrolled Streams for FIN TK-01 through TK-03 on the Tank Summary table with the uncontrolled emissions from the Condensate Truck Loading. Total Hydrocarbon Emissions were calculated as follows:

Total HC (lb/hr) = VOC Emissions (lb/hr) * (1/ VOC% of stream)
Total HC (lb/hr) = (192.89 lb/hr) * (1 / 71.72%)
Total HC (lb/hr) = 268.95 lb/hr

[b] Heating values taken from Perry's Chemical Engineers' Handbook , Table 3-207 (pg. 3-155)

[c] Emission Rates were proportioned from the Total Hydrocarbon Emissions using the Condensate Flash Gas stream constituents weight percents, generated by the WinSim program.

[d] An example calculation for the hourly flare feed rate for Methane is demonstrated.
MMBtu/hr Methane = Methane Heating Value (Btu/lb) * Hourly Methane Emissions (lb/hr) * 98% of stream is combusted / 10^6
MMBtu/hr Methane = (23,861 Btu/lb) * (31.79 lb/hr) * 98% / (10^6)
MMBtu/hr Methane = 0.74 MMBtu/hr

An example calculation for the annual flare feed rate for Methane is demonstrated.
MMBtu/yr Methane = Methane Heating Value (Btu/lb) * Annual Methane Emissions (T/yr) * (2,000 lb/T) * 98% of stream is combusted / 10^6
MMBtu/yr Methane = (23,861 Btu/lb) * (79.76 T/yr) * (2,000 lb/T) * 98% / (10^6)
MMBtu/yr Methane = 3,730.18 MMBtu/yr

CALCULATION OF FLARE FEED RATES FROM FIN TK-04 and TRUCK2

OIL & GAS STANDARD PERMIT REGISTRATION

DEWITT CENTRAL FACILITY 3

BURLINGTON RESOURCES OIL & GAS COMPANY LP

TK-04 and TRUCK2 Total Emissions:[a]

VOC Emissions (lb/hr): 3.34
VOC Emissions (TPY): 12.11
Hydrocarbon Emissions (lb/hr): 4.65
Hydrocarbon Emissions (TPY): 16.86

Constituent	Heating Value[b] (Btu/lb)	Produced Water Tanks Flash Gas Weight (%)	TK-04 and TRUCK2 Emissions[c] Hourly (lb/hr)	TK-04 and TRUCK2 Emissions[c] Annual (T/yr)	Flare Feed Rate[d] Hourly (MMBtu/hr)	Flare Feed Rate[d] Annual (MMBtu/yr)
Methane	23,861	11.49%	0.53	1.94	0.01	90.73
Ethane	22,304	14.66%	0.68	2.47	0.01	107.98
Propane	21,646	19.85%	0.92	3.35	0.02	142.13
I-Butane	21,242	7.80%	0.36	1.32	0.01	54.96
N-Butane	21,293	14.75%	0.69	2.49	0.01	103.92
I-Pentane	21,025	8.53%	0.40	1.44	0.01	59.34
N-Pentane	21,072	8.40%	0.39	1.42	0.01	58.65
Cyclopentane	20,350	0.00%	0.00	0.00	0.00	0.00
n-Hexane	20,928	7.29%	0.34	1.23	0.01	50.45
Cyclohexane	20,195	0.51%	0.02	0.09	0.0004	3.56
Other Hexanes	20,928	0.00%	0.00	0.00	0.00	0.00
Heptanes	20,825	3.17%	0.15	0.53	0.003	21.63
Octanes	20,747	0.60%	0.03	0.10	0.001	4.07
Nonanes	20,687	0.08%	0.004	0.01	0.0001	0.41
Decanes Plus	20,638	0.03%	0.001	0.01	0.00002	0.40
Benzene	18,172	0.26%	0.01	0.04	0.0002	1.42
Toluene	18,422	0.40%	0.02	0.07	0.0004	2.53
Ethylbenzene	18,658	0.03%	0.001	0.01	0.00002	0.37
Xylene	18,438	0.12%	0.01	0.02	0.0002	0.72
	VOC	71.82%				
				Total:	**0.10**	**703.27**

[a] Total VOC Emissions were determined by adding the Uncontrolled Streams for FIN TK-04 on the Tank Summary table and the uncontrolled emissions associated with the produced water loading, FIN TRUCK2. Total Hydrocarbon Emissions were calculated as follows:

Total HC (lb/hr) = VOC Emissions (lb/hr) * (1/ VOC% of stream)
Total HC (lb/hr) = (03.34 lb/hr) * (1/ 71.82%)
Total HC (lb/hr) = 4.65 lb/hr

[b] Heating values taken from Perry's Chemical Engineers' Handbook , Table 3-207 (pg. 3-155)

[c] Emission Rates were proportioned from the Total Hydrocarbon Emissions using the Produced Water Flash Gas stream constituents weight percents, generated by the WinSim program.

[d] An example calculation for the hourly flare feed rate for Methane is demonstrated.
MMBtu/hr Methane = Methane Heating Value (Btu/lb) * Hourly Methane Emissions (lb/hr) * 98% of stream is combusted / 10^6
MMBtu/hr Methane = (23,861 Btu/lb) * (0.53 lb/hr) * 98% / (10^6)
MMBtu/hr Methane = 0.01 MMBtu/hr

An example calculation for the annual flare feed rate for Methane is demonstrated.
MMBtu/yr Methane = Methane Heating Value (Btu/lb) * Annual Methane Emissions (T/yr) * (2,000 lb/T) * 98% of stream is combusted / 10^6
MMBtu/yr Methane = (23,861 Btu/lb) * (1.94 T/yr) * (2,000 lb/T) * 98% / (10^6)
MMBtu/yr Methane = 90.73 MMBtu/yr

CALCULATION OF STORAGE TANK WORKING AND BREATHING POTENTIAL TO EMIT DURING FLARE DOWNTIME -SMS

OIL & GAS STANDARD PERMIT REGISTRATION

DEWITT CENTRAL FACILITY 3

BURLINGTON RESOURCES OIL & GAS COMPANY LP

Variable	Description	Units	Value
L_T	total loss = Ls + Lw	Ton/yr	See Table
L_S	standing loss = 365 Vv Wv Ke Ks	lb/yr	See Table
L_W	working loss = 0.001 Mv Pv Q Kn Kp	lb/yr	See Table
L_H	working loss = 0.001 Mv Pmax Qh	lb/hr	See Table
	Roof Construction		Cone
RVP	Condensate Reid Vapor Pressure	psia	13.77
ΔPb	Breather vent pressure range	psi	0.06
I	Solar insolation factor	Btu/ft2-day	1521
P_A	Atmospheric Pressure	psia	14.7
Mv	Vapor Molecular Weight	lb/lb-mol	40
T	Annual Average Temperature	°F	72.1
T_{AX}	Daily Maximum Ambient Temperature	°R	541.6
T_{AN}	Daily Minimum Ambient Temperature	°R	522.5
ΔT_A	Daily average ambient temperature range	°R	19.1
Kp	Product factor		1

		Tank Specifications							Material Specifications												VOC		Benzene	
		V/H	D	H/L	Capacity	Color		α	Mv	P_{MAX}	Q^c	ΔTv	Hvo	T_{LA}	P_{VA}	Wv	ΔPv	Ke	Ks	L_S	L_T	L_H	L_T	L_H
Material	No. of Tanks	Tank Type	Tank Diameter (ft)	Tank Height/ Length (ft)	Tank Capacity (bbl)	Paint Color	Paint Conditions	Paint Solar Absorbance Factor	Vapor Molecular Weight	Reid Vapor Pressure (psia)	Max. Hourly Storage (bbl/hr)	Daily Vapor Temp. Range °F	Vapor Space Outage (ft)	Average Liquid Surface Temp °R	Average Vapor Pressure (psia)	Vapor Density (lb/ft3)	Daily Vapor Pressure Range	Vapor Space Expan. Factor	Vented Vapor Set. Factor	Standing Loss per tank (lb/yr)	Total Loss (lb/hr)	Total Loss (T/yr)	Total Loss (lb/hr)	Total Loss (T/yr)
Condensate	2	V	12	25	500	Gray	Good	0.54	40	13.77	500	36.75	12.63	539.8	15.456	0.10673	3.96891	-5.1024	0.09	0.00	**0.00**	**0.00**	**0.00**	**0.00**
Slop	1	V	12	25	500	Gray	Good	0.54	40	13.77	500	36.75	12.63	539.8	15.456	0.10673	3.96891	-5.1024	0.09	0.00	**0.00**	**0.00**	**0.00**	**0.00**
PW	1	V	12	25	500	Gray	Good	0.54	40	0.138	500	36.75	12.63	539.8	0.042	0.00029	0.02561	0.0662	0.97	0.19	**0.001**	**0.0001**	**0.00001**	**0.000001**

NOTE: Tank working and breathing emissions are based on the equations found in EPA AP 42 Chapter 7. All factors used are represented in the table on this page. The Condensate Reid Vapor Pressure and Vapor Molecular Weight are determined based on the WinSim condensate stream and Off Gas stream. All other variables are found in AP 42 Chapter 7 or are default unit values.

The emissions shown are due to flare maintenance occuring 2% of the year. During the flare downtime the wellhead would be shut in. Therefore, there would be no condensate or produced water liquids flowing to the tanks; however, any liquid already in the tanks would remain and have breathing (standing losses) emissions. These emissions would not be controlled, as the flare is down for maintenance. The calculations shown demonstrate this alternative operating scenario regarding flare maintenance and downtime. Based on 2% downtime, this scenario is being shown to occur for 175.2 hours in a year.

As shown on the summary page representing the Tank Emission sent to Flare, H_2S emissions are represented as occuring when the liquid streams flash during the change from a pressurized flow to the atmospheric tank. Due to the chemical properties of H_2S the most conservative approach is to represent that all H_2S in the liquid will immediately flash, and there will be no H_2S emitted during working and breathing while the liquids are stored. Since there will be no liquid flow during the flare downtime, there are no flash emissions and therefore no H_2S emissions from the standing loss of the tanks.

MSS CALCULATION OF COMPRESSOR ENGINE STARTER VENT POTENTIAL TO EMIT

OIL & GAS STANDARD PERMIT REGISTRATION

DEWITT CENTRAL FACILITY 3

BURLINGTON RESOURCES OIL & GAS COMPANY LP

Description	Facility Identification Number COMP-01-SV
Number of Engine Starts per Year	52
Number of Engine Starts per Hour	1
Start Volume per Event, scf	900
Fuel Stream Specific Gravity	0.8781
Fuel Stream Density, lb/scf [a]	0.0671
VOC Percentage in Fuel Stream, wt%	40%
Max Benzene Percentage in Gas Stream, wt%	0.26%
Max H_2S Percentage in Fuel Stream, wt%	0.10%
VOC Hourly Emission Rates (lb/hr): [b]	24.16
VOC Annual Emission Rates (T/yr): [c]	0.63
Benzene Hourly Emission Rates (lb/hr):[b]	0.16
Benzene Annual Emission Rates (T/yr): [c]	0.004
H_2S Hourly Emission Rates (lb/hr): [b]	0.06
H_2S Annual Emission Rates (T/yr): [c]	0.002

[a] Gas stream density is calculated as follows:

(28.96 lb/mole) / (379 scf/mole) * (0.8781) = 0.067 lb/scf

[b] Hourly starter vent VOC, benzene and H2S emissions are calculated based upon a conservative estimate of the portion of each consituent in the volume known to blow down from the engine source. An example calculation for VOC for COMP-01-

VOC lb/hr = (1 startup/hr) * (900 scf/startup) * (0.067 lb/scf) * (40.00%) = 24.16 lb/hr

[c] Annual starter VOC emission rates are calculated as follows:

VOC lb/hr = (52 startups/yr) * (900 scf/startup) * (0.067 lb/scf) * (40.00%) / (2,000 lb/T) = 0.63 T/yr

SMSS - CALCULATION OF COMPRESSOR ENGINE BLOWDOWN POTENTIAL TO EMIT

OIL & GAS STANDARD PERMIT REGISTRATION

DEWITT CENTRAL FACILITY 3

BURLINGTON RESOURCES OIL & GAS COMPANY LP

Description	Facility Identification Number COMP-01-BD
Number of Blowdowns per Year	52
Number of Blowdowns per Hour	1
Blowdown Volume per Event, scf	1,061
Gas Stream Specific Gravity	0.8781
Gas Stream Density, lb/scf [a]	0.0671
Max VOC Percentage in Gas Stream, wt%	40%
Max Benzene Percentage in Gas Stream, wt%	0.26%
Max H_2S Percentage in Gas Stream, wt%	0.10%
VOC Hourly Emission Rates (lb/hr): [b]	28.48
VOC Annual Emission Rates (T/yr): [c]	0.74
Benzene Hourly Emission Rates (lb/hr):[b]	0.19
Benzene Annual Emission Rates (T/yr): [c]	0.005
H_2S Hourly Emission Rates (lb/hr): [b]	0.07
H_2S Annual Emission Rates (T/yr): [c]	0.002
Controlled VOC Hourly Emission Rates (lb/hr)[d]	0.57
Controlled VOC Annual Emission Rates (T/yr):[c]	0.01
Controlled Benzene Hourly Emission Rates (lb/hr):[d]	0.004
Controlled Benzene Annual Emission Rates (T/yr): [c]	0.0001
Controlled H_2S Hourly Emission Rates (lb/hr)[d]	0.001
Controlled H_2S Annual Emission Rates (T/yr):[c]	0.00004

[a] Gas stream density is calculated as follows:

(28.96 lb/mole) / (379 scf/mole) * (0.8781) = 0.067 lb/scf

[b] Hourly blowdown VOC, Benzene and H_2S emissions rates are calculated. An example calculation for VOC for COMP-01-BD is as follows:
VOC lb/hr = (1 blowdown/hr) * (1,061 scf/blowdown) * (0.067 lb/scf) * (40.00% VOC in Stream) * (100-98% controlled at flare) = 28.48 lb/hr

[c] Annual blowdown VOC, Benzene and H_2S emission rates are calculated as follows:
VOC lb/hr = (52 blowdowns/yr) * (1,061 scf/blowdown) * (0.067 lb/scf) * (40.00%) / (2,000 lb/T) * (100% - 98% controlled

[d] Hourly controlled blowdown VOC, Benzene and H_2S emissions are calculated based upon a conservative estimate of the portion of each consituent in the volume known to blowdown from the engine source. An example calculation for VOC for
VOC lb/hr = (1 blowdown/hr) * (1,061 scf/blowdown) * (0.067 lb/scf) * (40.00% VOC in Stream) * (100-98% controlled at

[c] Annual controlled blowdown VOC emission rates are calculated as follows:
VOC lb/hr = (52 blowdowns/yr) * (1,061 scf/blowdown) * (0.067 lb/scf) * (40.00%) / (2,000 lb/T) * (100% - 98% controlled

SMSS - PROCESS FLARE WASTE GAS COMBUSTION EMISSIONS

OIL & GAS STANDARD PERMIT REGISTRATION

DEWITT CENTRAL FACILITY 3

BURLINGTON RESOURCES OIL & GAS COMPANY LP

EPN	FIN	Description	LHV[a] (Btu/scf)	Waste Gas Flow Rate Hourly (MMBtu/hr)	Waste Gas Flow Rate Annual (MMBtu/yr)	Pollutant	Emission Factors	Units	Potential to Emit Hourly[b] (lb/hr)	Potential to Emit Annual[c] (T/yr)
FL-1-SMSS	COMP-01-BD	Process Flare	1,448	1.52	79,588.49	CO	0.2755	lb/MMBtu	0.42	10.96
		Compressor Blowdown Event				NO_X	0.1380	lb/MMBtu	0.21	5.49
						$PM/PM_{10}/PM_{2.5}$	--[e]	--	--	--
						SO_2	--[c]	--	0.13	0.004
						H_2S	--[c]	--	0.001	0.00004

[a] Waste gas stream lower heating value was taken from the inlet gas analysis.

[b] Emission Factors for CO and NO_X are based upon the Draft TNRCC Guidance Document for Flares and Vapor Oxidizers (dated 10/00) for other high-Btu flares. An example calculation for hourly CO emissions for EPN Fl-1-SMSS follows:

CO (lb/hr) = (Hourly Waste Gas Flow Rate, MMBtu/hr)*(Emission Factor, lb/MMBtu)

CO (lb/hr) = (1.52 MMBtu/hr)*(0.2755 lb/MMBtu)

= 0.42 lb/hr CO

[c] H_2S emissions are routed from the separator to the flare and then converted to SO_2. SO_2 emission rates were determined based on the combustion efficiency of 98% H_2S converted to SO_2. H_2S emitted at the flare is 2% of the captured stream not converted by combustion. An example calculation for hourly SO_2 emissions for EPN FL-1-SMSS follows:

SO_2 (lb/hr) = (Source H_2S Emission Rate, lb/hr) * (98% captured H2S stream) * (98% conversion to SO_2 at combustion) * (1 mol H_2S/34.07 lb H_2S) * (64.06 lb SO2/1 mol SO_2)

SO_2 (lb/hr) = (0.07 lb/hr H2S from Blowdown)* (98%) * (98%) * (1 mol H2S/34.07 lb H2S) * (64.06 lb SO2/1 mol SO2)

= 0.13 lb/hr SO_2

[d] An example calculation for annual CO emissions for EPN FL-1-SMSS follows:

CO (T/yr) = (Annual Waste Gas Flow Rate, MMBtu/yr) * (Emission Factor, lb/MMBtu) * (1 T / 2,000 lb

CO (T/yr) = (79588.49 MMBtu/yr) * (0.2755 lb/MMBtu) * (1 T / 2,000 lb)

= 10.96 T/yr CO

[e] The process flares are smokeless per 40 CFR §60.18 requirements; therefore, PM emissions are negligible.

SMSS - CALCULATION OF FLARE FEED RATES FROM BLOWDOWN EVENTS

OIL & GAS STANDARD PERMIT REGISTRATION

DEWITT CENTRAL FACILITY 3

BURLINGTON RESOURCES OIL & GAS COMPANY LP

Max Engine BD Volume (Mscf/hr)	1.06
Max Engine BD Volume (Mscf/yr)	55,172
Gas Density (lb/scf)	0.0671

Constituent	Heating Value[a] (Btu/lb)	Inlet Gas Weight (%)	Engine BD Emissions[b] Hourly (lb/hr)	Engine BD Emissions[b] Annual (T/yr)	Flare Feed Rate[c] Hourly (MMBtu/hr)	Flare Feed Rate[c] Annual (MMBtu/yr)
Methane	23,861	43.31%	30.80	801.68	0.72	37,492.62
Ethane	22,304	16.27%	11.57	301.16	0.25	13,165.46
Propane	21,646	12.06%	8.58	223.23	0.18	9,470.79
I-Butane	21,242	3.93%	2.80	72.75	0.06	3,028.90
N-Butane	21,293	6.68%	4.75	123.65	0.10	5,160.44
I-Pentane	21,025	3.70%	2.63	68.49	0.05	2,822.40
N-Pentane	21,072	3.27%	2.33	60.53	0.05	2,499.96
Cyclopentane	20,350	0.00%	0.00	0.00	0.00	0.00
n-Hexane	20,928	1.67%	1.19	30.91	0.02	1,267.89
Cyclohexane	20,195	0.60%	0.43	11.11	0.01	439.76
Other Hexanes	20,928	3.38%	2.40	62.56	0.05	2,566.14
Heptanes	20,825	1.38%	0.98	25.54	0.02	1,042.47
Octanes	20,747	0.22%	0.16	4.07	0.003	165.50
Nonanes	20,687	0.08%	0.06	1.48	0.001	60.01
Decanes Plus	20,638	0.00%	0.00	0.00	0.00	0.00
Benzene	18,172	0.18%	0.13	3.33	0.002	118.61
Toluene	18,422	0.34%	0.24	6.29	0.004	227.11
Ethylbenzene	18,658	0.01%	0.01	0.19	0.0002	6.95
Xylene	18,438	0.08%	0.06	1.48	0.001	53.48
				Totals:	**1.52**	**79,588.49**

[a] Heating values taken from Perry's Chemical Engineers' Handbook , Table 3-207 (pg. 3-155)

[b] Constituent Emission Rates were calculated from the known maximum blowdown volumes and density then proportioned using the Inlet Gas stream constituents weight percents. An example calculation for Methane emissions is as follows:

Methane (lb/hr) = Maximum BD Volume (Mscf/hr) * Gas Density (lb/scf) * Inlet Gas Weight % * 1000
Methane (lb/hr) = (1.06 Mscf/hr) * (0.0671 lb/scf) * 43.31% * 1,000
Methane (lb/hr) = 30.80 lb/hr

[c] An example calculation for the hourly flare feed rate for Methane is demonstrated.

MMBtu/hr Methane = Methane Heating Value (Btu/lb) * Hourly Methane Emissions (lb/hr) * 98% of stream is combusted / 10^6
MMBtu/hr Methane = (23,861 Btu/lb) * (0,030.80 lb/hr) * 98% / (10^6)
MMBtu/hr Methane = 0.72 MMBtu/hr

An example calculation for the annual flare feed rate for Methane is demonstrated.

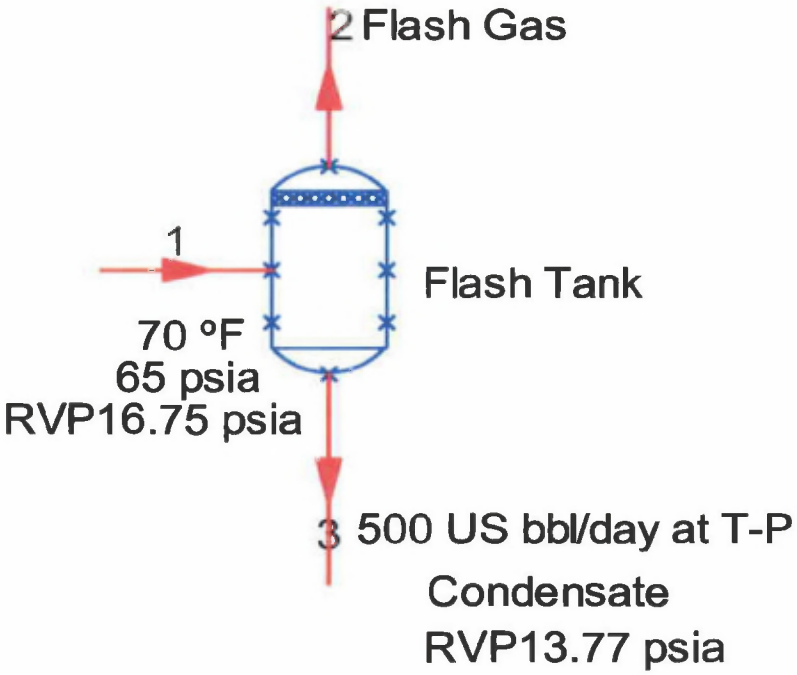
MMBtu/yr Methane = Methane Heating Value (Btu/lb) * Annual Methane Emissions (T/yr) * (2,000 lb/T) * 98% of stream is combusted / 10^6
MMBtu/yr Methane = (23,861 Btu/lb) * (801.68 T/yr) * (2,000 lb/T) * 98% / (10^6)
MMBtu/yr Methane = 37,492.62 MMBtu/yr

DESIGN II for Windows

CONDENSATE SUMMARY REPORT

Simulation Result: **SOLUTION REACHED**

Problem:
Project:
Task:
By:
At: 6-Feb-12 8:30 PM



Details for Stream 1

Stream 1 (Strm 1)

Thermodynamic Methods	K-Value:	PENG-ROB	Enthalpy:	PENG-RDB	Density:	STD
	Vapor Visc:	NBS81	Vapor ThC:	NBS81	Vapor Den:	STD
	Liquid 1 Visc:	NBS81	Liquid 1 ThC:	NBS81	Liquid 1 Den:	STD
	Liquid 2 Visc:	STEAM	Liquid 2 ThC:	STEAM	Liquid 2 Den:	STD

Flowrates

Component Name	Total lbmol/hr	Vapor lbmol/hr	Liquid 1 lbmol/hr	Liquid 2 lbmol/hr	Total mole %	K-Value
46 : NITROGEN	0.010799	0.00443	0.006369	0	0.019	126.554
49 : CARBON DIOXIDE	0.051722	0.003557	0.048165	0	0.090999	13.4357
2 : METHANE	1.11117	0.220878	0.890294	0	1.95498	45.1397
3 : ETHANE	1.06286	0.038547	1.02431	0	1.86998	6.84701
4 : PROPANE	1.87279	0.019252	1.85354	0	3.29497	1.88982
5 : ISOBUTANE	1.13334	0.004551	1.12879	0	1.99398	0.733574
6 : N-BUTANE	2.89416	0.008234	2.88593	0	5.09195	0.519092
9 : 2,2-DIMETHYLPROP	0	0	0	0	0	0.338185
7 : ISOPENTANE	3.43241	0.003596	3.42882	0	6.03894	0.190826
8 : N-PENTANE	4.22416	0.00352	4.22064	0	7.43193	0.151751
54 : 2,2-DIMETHYLBUTA	0	0	0	0	0	0.082004
55 : 2,3-DIMETHYLBUTA	0	0	0	0	0	0.059844
52 : 2-METHYLPENTANE	0	0	0	0	0	0.053774
53 : 3-METHYLPENTANE	0	0	0	0	0	0.047885
10 : N-HEXANE	10.52	0.002523	10.5175	0	18.5088	0.043638
37 : METHYLCYCLOPENTA	0	0	0	0	0	0.035014
40 : BENZENE	0.428554	0.00009799	0.428456	0	0.753992	0.041613
38 : CYCLOHEXANE	1.00602	0.000182	1.00584	0	1.76998	0.032891
79 : 2-METHYLHEXANE	0	0	0	0	0	0.014927
80 : 3-METHYLHEXANE	0	0	0	0	0	0.015009
11 : N-HEPTANE	12.743	0.000955	12.742	0	22.4198	0.013631
39 : METHYLCYCLOHEXAN	0	0	0	0	0	0.011656
41 : TOLUENE	2.27577	0.000131	2.27564	0	4.00396	0.010493
12 : N-OCTANE	6.74092	0.000161	6.74076	0	11.8599	0.004348
45 : ETHYL BENZENE	0.397294	0.000008727	0.397285	0	0.698993	0.003997
43 : M-XYLENE	1.85745	0.00003426	1.85741	0	3.26797	0.003356
42 : O-XYLENE	0	0	0	0	0	0.001707
13 : N-NONANE	2.53268	0.00001959	2.53266	0	4.45596	0.001407
14 : N-DECANE	2.54291	0.000006309	2.5429	0	4.47396	0.000451
62 : WATER	0	0	0	0	0	0.005617
Total	56.838	0.310683	56.5273	0	100	

Flowrates

Component Name	Total lb/hr	Vapor lb/hr	Liquid 1 lb/hr	Liquid 2 lb/hr	Total mass %
46 : NITROGEN	0.30252	0.124101	0.178419	0	0.005899
49 : CARBON DIOXIDE	2.27623	0.156529	2.1197	0	0.044384
2 : METHANE	17.8265	3.54354	14.283	0	0.347595
3 : ETHANE	31.9581	1.15904	30.799	0	0.623144
4 : PROPANE	82.5789	0.848911	81.73	0	1.61019
5 : ISOBUTANE	65.8696	0.26451	65.6051	0	1.28438
6 : N-BUTANE	168.209	0.478537	167.73	0	3.27987
9 : 2,2-DIMETHYLPROP	0	0	0	0	0
7 : ISOPENTANE	247.635	0.25945	247.375	0	4.82858
8 : N-PENTANE	304.756	0.253969	304.502	0	5.94238
54 : 2,2-DIMETHYLBUTA	0	0	0	0	0
55 : 2,3-DIMETHYLBUTA	0	0	0	0	0
52 : 2-METHYLPENTANE	0	0	0	0	0
53 : 3-METHYLPENTANE	0	0	0	0	0
10 : N-HEXANE	906.533	0.217374	906.315	0	17.6763
37 : METHYLCYCLOPENTA	0	0	0	0	0
40 : BENZENE	33.4735	0.007654	33.4659	0	0.652693
38 : CYCLOHEXANE	84.6628	0.015302	84.6475	0	1.65082
79 : 2-METHYLHEXANE	0	0	0	0	0
80 : 3-METHYLHEXANE	0	0	0	0	0
11 : N-HEPTANE	1276.82	0.095653	1276.72	0	24.8964
39 : METHYLCYCLOHEXAN	0	0	0	0	0
41 : TOLUENE	209.676	0.012091	209.664	0	4.08843
12 : N-OCTANE	769.975	0.018401	769.956	0	15.0136
45 : ETHYL BENZENE	42.1767	0.000927	42.1758	0	0.822395
43 : M-XYLENE	197.187	0.003637	197.183	0	3.8449
42 : O-XYLENE	0	0	0	0	0
13 : N-NONANE	324.816	0.002512	324.813	0	6.33351
14 : N-DECANE	361.795	0.000898	361.794	0	7.05456
62 : WATER	0	0	0	0	0
Total	5128.52	7.46303	5121.06	0	100

Flowrates

Component Name	Total ft3/hr	Vapor ft3/hr	Liquid 1 ft3/hr	Liquid 2 ft3/hr	Total volume %
46 : NITROGEN	0.395594	0.381884	0.01371	0	0.266457
49 : CARBON DIOXIDE	0.410284	0.306602	0.103682	0	0.276352
2 : METHANE	20.9568	19.0403	1.91647	0	14.1157
3 : ETHANE	5.52784	3.32288	2.20497	0	3.72335
4 : PROPANE	5.64959	1.6596	3.98999	0	3.80536
5 : ISOBUTANE	2.82218	0.392317	2.42986	0	1.90092
6 : N-BUTANE	6.92209	0.70976	6.21234	0	4.66247
9 : 2,2-DIMETHYLPROP	0	0	0	0	0
7 : ISOPENTANE	7.69097	0.31	7.38097	0	5.18036
8 : N-PENTANE	9.38892	0.303452	9.08547	0	6.32403
54 : 2,2-DIMETHYLBUTA	0	0	0	0	0
55 : 2,3-DIMETHYLBUTA	0	0	0	0	0
52 : 2-METHYLPENTANE	0	0	0	0	0
53 : 3-METHYLPENTANE	0	0	0	0	0
10 : N-HEXANE	22.8578	0.217452	22.6403	0	15.3962
37 : METHYLCYCLOPENTA	0	0	0	0	0
40 : BENZENE	0.930755	0.008447	0.922308	0	0.626922
38 : CYCLOHEXANE	2.18088	0.015674	2.1652	0	1.46896
79 : 2-METHYLHEXANE	0	0	0	0	0
80 : 3-METHYLHEXANE	0	0	0	0	0
11 : N-HEPTANE	27.5111	0.082293	27.4288	0	18.5305
39 : METHYLCYCLOHEXAN	0	0	0	0	0
41 : TOLUENE	4.90992	0.011313	4.89861	0	3.30714
12 : N-OCTANE	14.5242	0.013887	14.5104	0	9.783
45 : ETHYL BENZENE	0.85596	0.000752	0.855207	0	0.576543
43 : M-XYLENE	4.00128	0.002954	3.99832	0	2.69511
42 : O-XYLENE	0	0	0	0	0
13 : N-NONANE	5.45356	0.001689	5.45187	0	3.67332
14 : N-DECANE	5.47447	0.000544	5.47392	0	3.6874
62 : WATER	0	0	0	0	0
Total	148.464	26.7818	121.682	0	100

Flowrates

Component Name	Total SCF/hr	Vapor SCF/hr	Liquid 1 SCF/hr	Liquid 2 SCF/hr	Total std vol %
46 : NITROGEN	1.68468	1.68113	0.003546	0	0.707663
49 : CARBON DIOXIDE	1.39108	1.34973	0.041347	0	0.584333
2 : METHANE	84.5832	83.8194	0.763743	0	35.5298
3 : ETHANE	16.0136	14.628	1.3856	0	6.72665
4 : PROPANE	9.88881	7.30593	2.58288	0	4.15387
5 : ISOBUTANE	3.59577	1.72706	1.86871	0	1.51043
6 : N-BUTANE	7.72933	3.12451	4.60482	0	3.24677
9 : 2,2-DIMETHYLPROP	0	0	0	0	0
7 : ISOPENTANE	7.71535	1.36469	6.35066	0	3.2409
8 : N-PENTANE	9.07241	1.33586	7.73655	0	3.81094
54 : 2,2-DIMETHYLBUTA	0	0	0	0	0
55 : 2,3-DIMETHYLBUTA	0	0	0	0	0
52 : 2-METHYLPENTANE	0	0	0	0	0
53 : 3-METHYLPENTANE	0	0	0	0	0
10 : N-HEXANE	22.8429	0.95727	21.8856	0	9.59533
37 : METHYLCYCLOPENTA	0	0	0	0	0
40 : BENZENE	0.643857	0.037187	0.60667	0	0.270457
38 : CYCLOHEXANE	1.8014	0.069	1.7324	0	0.756693
79 : 2-METHYLHEXANE	0	0	0	0	0
80 : 3-METHYLHEXANE	0	0	0	0	0
11 : N-HEPTANE	30.1097	0.362271	29.7474	0	12.6478
39 : METHYLCYCLOHEXAN	0	0	0	0	0
41 : TOLUENE	3.90595	0.049802	3.85615	0	1.64073
12 : N-OCTANE	17.5246	0.061132	17.4635	0	7.36135
45 : ETHYL BENZENE	0.779132	0.003312	0.77582	0	0.327281
43 : M-XYLENE	3.65234	0.013002	3.63933	0	1.53419
42 : O-XYLENE	0	0	0	0	0
13 : N-NONANE	7.22263	0.007434	7.2152	0	3.03393
14 : N-DECANE	7.90557	0.002394	7.90318	0	3.3208
62 : WATER	0	0	0	0	0
Total	238.062	117.899	120.163	0	100

Properties

Temperature	F	70		
Pressure	psia	64.696		
Enthalpy	Btu/hr	-728591.5		
Entropy	Btu/hr/R	-857.9095		
Vapor Fraction		0.005466123		
		Total	Vapor	Liquid 1
Flowrate	lbmol/hr	56.838	0.310683	56.5273
Flowrate	lb/hr	5128.5229	7.463	5121.0599
Mole Fraction		1	0.005466	0.994534
Mass Fraction		1	0.001455	0.998545
Molecular Weight		90.2305	24.0213	90.5944
Enthalpy	Btu/lbmol	-12818.74	339.9429	-12891.0623
Enthalpy	Btu/lb	-142.0665	14.1517	-142.2942
Entropy	Btu/lbmol/R	-15.0939	-0.007032	-15.1769
Entropy	Btu/lb/R	-0.167282	-0.0002927	-0.167525
Cp	Btu/lbmol/R		11.1332	45.169
Cp	Btu/lb/R		0.4635	0.4986
Cv	Btu/lbmol/R		8.9836	38.4293
Cv	Btu/lb/R		0.374	0.4242
Cp/Cv			1.2393	1.1754
Density	lb/ft3		0.278661	42.0855
Z-Factor			0.981281	0.024504
Flowrate (T-P)	ft3/s		0.007439	
Flowrate (T-P)	gal/min			15.1718
Flowrate (STP)	MMSCFD		0.00283	
Flowrate (STP)	gal/min			14.9814
Specific Gravity	GPA STP			0
Viscosity	cP		0.010907	0.420862
Thermal Conductivity	Btu/hr/ft/R		0.016634	0.0722
Surface Tension	dyne/cm			18.405
Reid Vapor Pressure (ASTM-A	psia			16.75
True Vapor Pressure at 100 F	psia			90.18
Critical Temperature (Cubic E	F	506.569		
Critical Pressure (Cubic EOS)	psia	541.5574		
Dew Point Temperature	F	327.8695		
Bubble Point Temperature	F	38.6607		
Water Dew Point Temperature could not be calculated				
Stream Vapor Pressure	psia	77.0639		
Latent Heat of Vaporization (N	Btu/lb	123.5077		
Latent Heat of Vaporization (P	Btu/lb	267.3275		
Vapor Sonic Velocity	ft/s	1142.29		
CO2 Freeze Up		No		
Heating Value (gross)	Btu/SCF	4912.92		
Heating Value (net)	Btu/SCF	4562.12		
Wobbe Number	Btu/SCF	2684.07		
Average Hydrogen Atoms		13.9424		
Average Carbon Atoms		6.3399		
Hydrogen to Carbon Ratio		2.1991		

Details for Stream 2

Stream 2 (Flash Gas)

Thermodynamic Methods	K-Value:	PENG-ROB	Enthalpy:	PENG-ROB	Density:	STD
	Vapor Visc:	NBS81	Vapor ThC:	NBS81	Vapor Den:	STD

Flowrates

Component Name	Total lbmol/hr	Vapor lbmol/hr	Incipient Liquid 1 mol fra	Liquid 2 lbmol/hr	Total mole %	K-Value
46 : NITROGEN	0.01051	0.01051	0.000005417	0	0.302641	558.647
49 : CARBON DIOXIDE	0.040839	0.040839	0.000204	0	1.17597	57.6616
2 : METHANE	1.03101	1.03101	0.001502	0	29.6884	197.635
3 : ETHANE	0.69652	0.69652	0.006865	0	20.0566	29.2168
4 : PROPANE	0.636861	0.636861	0.02316	0	18.3387	7.91831
5 : ISOBUTANE	0.186845	0.186845	0.017736	0	5.38028	3.03351
6 : N-BUTANE	0.353043	0.353043	0.047618	0	10.166	2.13494
9 : 2,2-DIMETHYLPROP	0	0	0	0	0	1.48838
7 : ISOPENTANE	0.164321	0.164321	0.06124	0	4.73171	0.772649
8 : N-PENTANE	0.161857	0.161857	0.076123	0	4.66076	0.612271
54 : 2,2-DIMETHYLBUTA	0	0	0	0	0	0.360909
55 : 2,3-DIMETHYLBUTA	0	0	0	0	0	0.263381
52 : 2-METHYLPENTANE	0	0	0	0	0	0.236664
53 : 3-METHYLPENTANE	0	0	0	0	0	0.210746
10 : N-HEXANE	0.117442	0.117442	0.194932	0	3.3818	0.173486
37 : METHYLCYCLOPENTA	0	0	0	0	0	0.154099
40 : BENZENE	0.004588	0.004588	0.007945	0	0.132104	0.166281
38 : CYCLOHEXANE	0.008488	0.008488	0.018693	0	0.244413	0.130754
79 : 2-METHYLHEXANE	0	0	0	0	0	0.065693
80 : 3-METHYLHEXANE	0	0	0	0	0	0.066054
11 : N-HEPTANE	0.043923	0.043923	0.237964	0	1.2648	0.053151
39 : METHYLCYCLOHEXAN	0	0	0	0	0	0.051298
41 : TOLUENE	0.006093	0.006093	0.042531	0	0.175461	0.041255
12 : N-OCTANE	0.007311	0.007311	0.12618	0	0.210523	0.016684
45 : ETHYL BENZENE	0.000399	0.000399	0.007437	0	0.011489	0.015448
43 : M-XYLENE	0.001567	0.001567	0.034777	0	0.045128	0.012976
42 : O-XYLENE	0	0	0	0	0	0.007514
13 : N-NONANE	0.000875	0.000875	0.047443	0	0.025209	0.005314
14 : N-DECANE	0.000277	0.000277	0.047646	0	0.007962	0.001671
62 : WATER	0	0	0	0	0	0.024719
Total	3.47277	3.47277	1	0	100	

Flowrates

Component Name	Total lb/hr	Vapor lb/hr	Incipient Liquid 1 mass fra	Liquid 2 lb/hr	Total mass %
46 : NITROGEN	0.294421	0.294421	0.000002	0	0.210424
49 : CARBON DIOXIDE	1.79726	1.79726	0.000096	0	1.2845
2 : METHANE	16.5404	16.5404	0.000258	0	11.8215
3 : ETHANE	20.943	20.943	0.002208	0	14.968
4 : PROPANE	28.0817	28.0817	0.01092	0	20.0701
5 : ISOBUTANE	10.8594	10.8594	0.01103	0	7.76125
6 : N-BUTANE	20.5188	20.5188	0.02961	0	14.6649
9 : 2,2-DIMETHYLPROP	0	0	0	0	0
7 : ISOPENTANE	11.8551	11.8551	0.04726	0	8.47289
8 : N-PENTANE	11.6774	11.6774	0.05875	0	8.34585
54 : 2,2-DIMETHYLBUTA	0	0	0	0	0
55 : 2,3-DIMETHYLBUTA	0	0	0	0	0
52 : 2-METHYLPENTANE	0	0	0	0	0
53 : 3-METHYLPENTANE	0	0	0	0	0
10 : N-HEXANE	10.1202	10.1202	0.1797	0	7.23295
37 : METHYLCYCLOPENTA	0	0	0	0	0
40 : BENZENE	0.358333	0.358333	0.006638	0	0.256101
38 : CYCLOHEXANE	0.714308	0.714308	0.01683	0	0.510518
79 : 2-METHYLHEXANE	0	0	0	0	0
80 : 3-METHYLHEXANE	0	0	0	0	0
11 : N-HEPTANE	4.40104	4.40104	0.2551	0	3.14543
39 : METHYLCYCLOHEXAN	0	0	0	0	0
41 : TOLUENE	0.561405	0.561405	0.04192	0	0.401238
12 : N-OCTANE	0.83509	0.83509	0.1542	0	0.596841
45 : ETHYL BENZENE	0.042357	0.042357	0.008446	0	0.030273
43 : M-XYLENE	0.166372	0.166372	0.03949	0	0.118907
42 : O-XYLENE	0	0	0	0	0
13 : N-NONANE	0.112278	0.112278	0.06509	0	0.080246
14 : N-DECANE	0.03934	0.03934	0.07252	0	0.028116
62 : WATER	0	0	0	0	0
Total	139.918	139.918	1	0	100
	Total VOC	**100.343123**			

Flowrates

Component Name	Total ft3/hr	Vapor ft3/hr	Liquid 1 ft3/hr	Liquid 2 ft3/hr	Total volume %
46 : NITROGEN	4.01495	4.01495	0	0	0.302641
49 : CARBON DIOXIDE	15.6008	15.6008	0	0	1.17597
2 : METHANE	393.857	393.857	0	0	29.6884
3 : ETHANE	266.079	266.079	0	0	20.0566
4 : PROPANE	243.288	243.288	0	0	18.3387
5 : ISOBUTANE	71.3769	71.3769	0	0	5.38028
6 : N-BUTANE	134.866	134.866	0	0	10.166
9 : 2,2-DIMETHYLPROP	0	0	0	0	0
7 : ISOPENTANE	62.7726	62.7726	0	0	4.73171
8 : N-PENTANE	61.8315	61.8315	0	0	4.66076
54 : 2,2-DIMETHYLBUTA	0	0	0	0	0
55 : 2,3-DIMETHYLBUTA	0	0	0	0	0
52 : 2-METHYLPENTANE	0	0	0	0	0
53 : 3-METHYLPENTANE	0	0	0	0	0
10 : N-HEXANE	44.8643	44.8643	0	0	3.3818
37 : METHYLCYCLOPENTA	0	0	0	0	0
40 : BENZENE	1.75254	1.75254	0	0	0.132104
38 : CYCLOHEXANE	3.24248	3.24248	0	0	0.244413
79 : 2-METHYLHEXANE	0	0	0	0	0
80 : 3-METHYLHEXANE	0	0	0	0	0
11 : N-HEPTANE	16.7793	16.7793	0	0	1.2648
39 : METHYLCYCLOHEXAN	0	0	0	0	0
41 : TOLUENE	2.32773	2.32773	0	0	0.175461
12 : N-OCTANE	2.79288	2.79288	0	0	0.210523
45 : ETHYL BENZENE	0.152419	0.152419	0	0	0.011489
43 : M-XYLENE	0.598683	0.598683	0	0	0.045128
42 : O-XYLENE	0	0	0	0	0
13 : N-NONANE	0.334437	0.334437	0	0	0.025209
14 : N-DECANE	0.105628	0.105628	0	0	0.007962
62 : WATER	0	0	0	0	0
Total	**1326.64**	**1326.64**	0	0	100

Flowrates

Component Name	Total SCF/hr	Vapor SCF/hr	Liquid 1 SCF/hr	Liquid 2 SCF/hr	Total std vol %
46 : NITROGEN	3.98837	3.98837	0	0	0.302641
49 : CARBON DIOXIDE	15.4976	15.4976	0	0	1.17597
2 : METHANE	391.25	391.25	0	0	29.6884
3 : ETHANE	264.318	264.318	0	0	20.0566
4 : PROPANE	241.678	241.678	0	0	18.3387
5 : ISOBUTANE	70.9044	70.9044	0	0	5.38028
6 : N-BUTANE	133.974	133.974	0	0	10.166
9 : 2,2-DIMETHYLPROP	0	0	0	0	0
7 : ISOPENTANE	62.3572	62.3572	0	0	4.73171
8 : N-PENTANE	61.4222	61.4222	0	0	4.66076
54 : 2,2-DIMETHYLBUTA	0	0	0	0	0
55 : 2,3-DIMETHYLBUTA	0	0	0	0	0
52 : 2-METHYLPENTANE	0	0	0	0	0
53 : 3-METHYLPENTANE	0	0	0	0	0
10 : N-HEXANE	44.5673	44.5673	0	0	3.3818
37 : METHYLCYCLOPENTA	0	0	0	0	0
40 : BENZENE	1.74094	1.74094	0	0	0.132104
38 : CYCLOHEXANE	3.22102	3.22102	0	0	0.244413
79 : 2-METHYLHEXANE	0	0	0	0	0
80 : 3-METHYLHEXANE	0	0	0	0	0
11 : N-HEPTANE	16.6682	16.6682	0	0	1.2648
39 : METHYLCYCLOHEXAN	0	0	0	0	0
41 : TOLUENE	2.31233	2.31233	0	0	0.175461
12 : N-OCTANE	2.7744	2.7744	0	0	0.210523
45 : ETHYL BENZENE	0.15141	0.15141	0	0	0.011489
43 : M-XYLENE	0.594721	0.594721	0	0	0.045128
42 : O-XYLENE	0	0	0	0	0
13 : N-NONANE	0.332224	0.332224	0	0	0.025209
14 : N-DECANE	0.104929	0.104929	0	0	0.007962
62 : WATER	0	0	0	0	0
Total	1317.86	1317.86	0	0	100

Properties

Temperature	F	70	
Pressure	psia	14.7	
Enthalpy	Btu/hr	1989.754	
Entropy	Btu/hr/R	17.55417	
Vapor Fraction		1	
		Total	Vapor
Flowrate	lbmol/hr	3.4728	3.4728
Flowrate	lb/hr	139.9183	139.9183
Mole Fraction		1	1
Mass Fraction		1	1
Molecular Weight		**40.2902**	**40.2902**
Enthalpy	Btu/lbmol	572.9594	572.9594
Enthalpy	Btu/lb	14.2208	14.2208
Entropy	Btu/lbmol/R	5.0548	5.0548
Entropy	Btu/lb/R	0.12546	0.12546
Cp	Btu/lbmol/R		16.6373
Cp	Btu/lb/R		0.4129
Cv	Btu/lbmol/R		14.5606
Cv	Btu/lb/R		0.3614
Cp/Cv			1.1426
Density	lb/ft3		0.105468
Z-Factor			0.988073
Flowrate (T-P)	ft3/s		0.36851
Flowrate (STP)	MMSCFD		0.031629
Viscosity	cP		0.009105
Thermal Conductivity	Btu/hr/ft/R		0.011687
Critical Temperature (Cubic E	F	229.4131	
Critical Pressure (Cubic EOS)	psia	1280.8758	
Dew Point Temperature	F	70.0076	
Bubble Point Temperature	F	-245.9062	
Water Dew Point Temperature could not be calculated			
Stream Vapor Pressure	psia	978.1668	
Vapor Sonic Velocity	ft/s	852.7	
CO2 Freeze Up		No	
Heating Value (gross)	Btu/SCF	2271.65	
Heating Value (net)	**Btu/SCF**	**2087.58**	
Wobbe Number	Btu/SCF	1911.85	
Average Hydrogen Atoms		7.3172	
Average Carbon Atoms		2.7022	
Hydrogen to Carbon Ratio		2.7079	
Methane Number		39.22	
Motor Octane Number		97.49	

Details for Stream 3

Stream 3 (Condensate)

Thermodynamic Methods	K-Value:	PENG-ROB	Enthalpy:	PENG-ROB	Density:	STD
	Liquid 1 Visc:	NBS81	Liquid 1 ThC:	NBS81	Liquid 1 Den:	STD
	Liquid 2 Visc:	NBS81	Liquid 2 ThC:	NBS81	Liquid 2 Den:	STD

Flowrates

Component Name	Total lbmol/hr	Vapor lbmol/hr	Liquid 1 lbmol/hr	Liquid 2 lbmol/hr	Total mole %	K-Value
46 : NITROGEN	0.000289	0	0.000289	0	0.000542	
49 : CARBON DIOXIDE	0.010883	0	0.010883	0	0.020394	
2 : METHANE	0.080164	0	0.080164	0	0.150218	
3 : ETHANE	0.36634	0	0.36634	0	0.686476	
4 : PROPANE	1.23593	0	1.23593	0	2.31599	
5 : ISOBUTANE	0.946494	0	0.946494	0	1.77361	
6 : N-BUTANE	2.54112	0	2.54112	0	4.76175	
9 : 2,2-DIMETHYLPROP	0	0	0	0	0	
7 : ISOPENTANE	3.26809	0	3.26809	0	6.12401	
8 : N-PENTANE	4.0623	0	4.0623	0	7.61226	
54 : 2,2-DIMETHYLBUTA	0	0	0	0	0	
55 : 2,3-DIMETHYLBUTA	0	0	0	0	0	
52 : 2-METHYLPENTANE	0	0	0	0	0	
53 : 3-METHYLPENTANE	0	0	0	0	0	
10 : N-HEXANE	10.4026	0	10.4026	0	19.4932	
37 : METHYLCYCLOPENTA	0	0	0	0	0	
40 : BENZENE	0.423967	0	0.423967	0	0.794462	
38 : CYCLOHEXANE	0.997535	0	0.997535	0	1.86926	
79 : 2-METHYLHEXANE	0	0	0	0	0	
80 : 3-METHYLHEXANE	0	0	0	0	0	
11 : N-HEPTANE	12.699	0	12.699	0	23.7964	
39 : METHYLCYCLOHEXAN	0	0	0	0	0	
41 : TOLUENE	2.26968	0	2.26968	0	4.2531	
12 : N-OCTANE	6.73361	0	6.73361	0	12.618	
45 : ETHYL BENZENE	0.396895	0	0.396895	0	0.743733	
43 : M-XYLENE	1.85588	0	1.85588	0	3.4777	
42 : O-XYLENE	0	0	0	0	0	
13 : N-NDNANE	2.5318	0	2.5318	0	4.74429	
14 : N-DECANE	2.54263	0	2.54263	0	4.76458	
62 : WATER	0	0	0	0	0	
Total	53.3652	0	53.3652	0	100	

Flowrates

Component Name	Total lb/hr	Vapor lb/hr	Liquid 1 lb/hr	Liquid 2 lb/hr	Total mass %
46 : NITROGEN	0.008099	0	0.008099	0	0.000162
49 : CARBON DIOXIDE	0.478968	0	0.478968	0	0.009601
2 : METHANE	1.28607	0	1.28607	0	0.02578
3 : ETHANE	11.0151	0	11.0151	0	0.220805
4 : PROPANE	54.4972	0	54.4972	0	1.09243
5 : ISOBUTANE	55.0102	0	55.0102	0	1.10272
6 : N-BUTANE	147.69	0	147.69	0	2.96054
9 : 2,2-DIMETHYLPROP	0	0	0	0	0
7 : ISOPENTANE	235.78	0	235.78	0	4.72637
8 : N-PENTANE	293.079	0	293.079	0	5.87496
54 : 2,2-DIMETHYLBUTA	0	0	0	0	0
55 : 2,3-DIMETHYLBUTA	0	0	0	0	0
52 : 2-METHYLPENTANE	0	0	0	0	0
53 : 3-METHYLPENTANE	0	0	0	0	0
10 : N-HEXANE	896.413	0	896.413	0	17.9692
37 : METHYLCYCLOPENTA	0	0	0	0	0
40 : BENZENE	33.1152	0	33.1152	0	0.663816
38 : CYCLOHEXANE	83.9485	0	83.9485	0	1.68281
79 : 2-METHYLHEXANE	0	0	0	0	0
80 : 3-METHYLHEXANE	0	0	0	0	0
11 : N-HEPTANE	1272.42	0	1272.42	0	25.5065
39 : METHYLCYCLOHEXAN	0	0	0	0	0
41 : TOLUENE	209.114	0	209.114	0	4.19184
12 : N-OCTANE	769.14	0	769.14	0	15.4179
45 : ETHYL BENZENE	42.1343	0	42.1343	0	0.844612
43 : M-XYLENE	197.02	0	197.02	0	3.94941
42 : O-XYLENE	0	0	0	0	0
13 : N-NONANE	324.703	0	324.703	0	6.5089
14 : N-DECANE	361.755	0	361.755	0	7.25163
62 : WATER	0	0	0	0	0
Total	4988.6	0	4988.6	0	100

Flowrates

Component Name	Total ft3/hr	Vapor ft3/hr	Liquid 1 ft3/hr	Liquid 2 ft3/hr	Total volume %
46 : NITROGEN	0.000634	0	0.000634	0	0.000542
49 : CARBON DIOXIDE	0.023872	0	0.023872	0	0.020394
2 : METHANE	0.175833	0	0.175833	0	0.150218
3 : ETHANE	0.803533	0	0.803533	0	0.686476
4 : PROPANE	2.71091	0	2.71091	0	2.31599
5 : ISOBUTANE	2.07605	0	2.07605	0	1.77361
6 : N-BUTANE	5.57372	0	5.57372	0	4.76175
9 : 2,2-DIMETHYLPROP	0	0	0	0	0
7 : ISOPENTANE	7.16827	0	7.16827	0	6.12401
8 : N-PENTANE	8.91029	0	8.91029	0	7.61226
54 : 2,2-DIMETHYLBUTA	0	0	0	0	0
55 : 2,3-DIMETHYLBUTA	0	0	0	0	0
52 : 2-METHYLPENTANE	0	0	0	0	0
53 : 3-METHYLPENTANE	0	0	0	0	0
10 : N-HEXANE	22.8172	0	22.8172	0	19.4932
37 : METHYLCYCLOPENTA	0	0	0	0	0
40 : BENZENE	0.929933	0	0.929933	0	0.794462
38 : CYCLOHEXANE	2.188	0	2.188	0	1.86926
79 : 2-METHYLHEXANE	0	0	0	0	0
80 : 3-METHYLHEXANE	0	0	0	0	0
11 : N-HEPTANE	27.8542	0	27.8542	0	23.7964
39 : METHYLCYCLOHEXAN	0	0	0	0	0
41 : TOLUENE	4.97833	0	4.97833	0	4.2531
12 : N-OCTANE	14.7696	0	14.7696	0	12.618
45 : ETHYL BENZENE	0.870553	0	0.870553	0	0.743733
43 : M-XYLENE	4.07071	0	4.07071	0	3.4777
42 : O-XYLENE	0	0	0	0	0
13 : N-NONANE	5.55328	0	5.55328	0	4.74429
14 : N-DECANE	5.57703	0	5.57703	0	4.76458
62 : WATER	0	0	0	0	0
Total	117.052	0	117.052	0	100

Flowrates

Component Name	Total SCF/hr	Vapor SCF/hr	Liquid 1 SCF/hr	Liquid 2 SCF/hr	Total std vol %
46 : NITROGEN	0.000161	0	0.000161	0	0.000139
49 : CARBON DIOXIDE	0.009343	0	0.009343	0	0.008065
2 : METHANE	0.068769	0	0.068769	0	0.059362
3 : ETHANE	0.495553	0	0.495553	0	0.427767
4 : PROPANE	1.72225	0	1.72225	0	1.48667
5 : ISOBUTANE	1.56692	0	1.56692	0	1.35258
6 : N-BUTANE	4.05484	0	4.05464	0	3.50001
9 : 2,2-DIMETHYLPROP	0	0	0	0	0
7 : ISOPENTANE	6.05298	0	6.05298	0	5.225
8 : N-PENTANE	7.44631	0	7.44631	0	6.42774
54 : 2,2-DIMETHYLBUTA	0	0	0	0	0
55 : 2,3-DIMETHYLBUTA	0	0	0	0	0
52 : 2-METHYLPENTANE	0	0	0	0	0
53 : 3-METHYLPENTANE	0	0	0	0	0
10 : N-HEXANE	21.6465	0	21.6465	0	18.6855
37 : METHYLCYCLOPENTA	0	0	0	0	0
40 : BENZENE	0.600313	0	0.600313	0	0.518197
38 : CYCLOHEXANE	1.71809	0	1.71809	0	1.48308
79 : 2-METHYLHEXANE	0	0	0	0	0
80 : 3-METHYLHEXANE	0	0	0	0	0
11 : N-HEPTANE	29.6471	0	29.6471	0	25.5917
39 : METHYLCYCLOHEXAN	0	0	0	0	0
41 : TOLUENE	3.84605	0	3.84605	0	3.31995
12 : N-OCTANE	17.445	0	17.445	0	15.0587
45 : ETHYL BENZENE	0.775058	0	0.775058	0	0.669039
43 : M-XYLENE	3.63633	0	3.63633	0	3.13892
42 : O-XYLENE	0	0	0	0	0
13 : N-NONANE	7.21276	0	7.21276	0	6.22614
14 : N-DECANE	7.90234	0	7.90234	0	6.82139
62 : WATER	0	0	0	0	0
Total	115.846	0	115.846	0	100

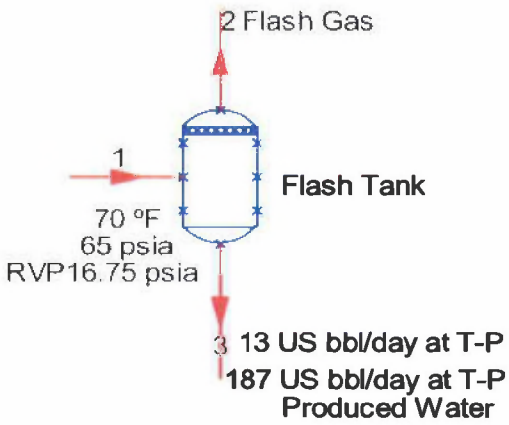
Properties

Temperature	F	70	
Pressure	psia	14.7	
Enthalpy	Btu/hr	-711109.1	
Entropy	Btu/hr/R	-831.7422	
Vapor Fraction		0	
		Total	Liquid 1
Flowrate	lbmol/hr	53.3652	53.3652
Flowrate	lb/hr	4988.6046	4988.6046
Mole Fraction		1	1
Mass Fraction		1	1
Molecular Weight		93.4804	93.4804
Enthalpy	Btu/lbmol	-13325.3266	-13325.3266
Enthalpy	Btu/lb	-142.5467	-142.5467
Entropy	Btu/lbmol/R	-15.5858	-15.5858
Entropy	Btu/lb/R	-0.166728	-0.166728
Cp	Btu/lbmol/R		46.3665
Cp	Btu/lb/R		0.496
Cv	Btu/lbmol/R		39.6231
Cv	Btu/lb/R		0.4239
Cp/Cv			1.1702
Density	lb/ft3		42.6188
Z-Factor			0.005673
Flowrate (T-P)	gal/min		14.5944
Flowrate (STP)	gal/min		14.4432
Specific Gravity	GPA STP		0.69047
Viscosity	cP		0.429689
Thermal Conductivity	Btu/hr/ft/R		0.070814
Surface Tension	dyne/cm		19.3862
Reid Vapor Pressure (ASTM-A	**psia**		**13.77**
True Vapor Pressure at 100 F	psia		20.45
Critical Temperature (Cubic E	F	513.4594	
Critical Pressure (Cubic EOS)	psia	496.1832	
Dew Point Temperature	F	234.0836	
Bubble Point Temperature	F	69.9813	
Water Dew Point Temperature could not be calculated			
Stream Vapor Pressure	psia	14.7	
Latent Heat of Vaporization (N	Btu/lb	140.8591	
Latent Heat of Vaporization (P	Btu/lb	224.7066	
CO2 Freeze Up		No	
Heating Value (gross)	Btu/SCF	5084.8	
Heating Value (net)	Btu/SCF	4723.15	
Wobbe Number	Btu/SCF	2721.44	
Average Hydrogen Atoms		14.3735	
Average Carbon Atoms		6.5766	
Hydrogen to Carbon Ratio		2.1855	

DESIGN II for Windows

Simulation Result: SOLUTION REACHED

Problem:
Project:
Task:
By:
At: 26-Apr-12 11:20 AM



Details for Stream 1

Stream 1 (Strm 1)

Thermodynamic Methods	K-Value:	PENG-ROB	Enthalpy:	PENG-ROB	Density:	STD
	Liquid 1 Visc:	NBS81	Liquid 1 ThC:	NBS81	Liquid 1 Den:	STD
	Liquid 2 Visc:	STEAM	Liquid 2 ThC:	STEAM	Liquid 2 Den:	STD

Flowrates

Component Name	Total lbmol/hr	Vapor lbmol/hr	Liquid 1 lbmol/hr	Liquid 2 lbmol/hr	Total mole %	K-Value
46 : NITROGEN	0.00029	0	0.000172	0.000118	0.00019	126.663
49 : CARBON DIOXIDE	0.00139	0	0.000284	0.001106	0.00091	13.439
2 : METHANE	0.029855	0	0.020422	0.009433	0.01955	45.1845
3 : ETHANE	0.028557	0	0.0265	0.002057	0.0187	6.85632
4 : PROPANE	0.050319	0	0.049006	0.001313	0.03295	1.89375
5 : ISOBUTANE	0.030451	0	0.03037	0.00008117	0.01994	0.735734
6 : N-BUTANE	0.077761	0	0.077614	0.000147	0.05092	0.520539
9 : 2,2-DIMETHYLPROP	0	0	0	0	0	0.338185
7 : ISOPENTANE	0.092223	0	0.092158	0.00006412	0.06039	0.191542
8 : N-PENTANE	0.113495	0	0.113433	0.00006275	0.07432	0.152287
54 : 2,2-DIMETHYLBUTA	0	0	0	0	0	0.082004
55 : 2,3-DIMETHYLBUTA	0	0	0	0	0	0.059844
52 : 2-METHYLPENTANE	0	0	0	0	0	0.053774
53 : 3-METHYLPENTANE	0	0	0	0	0	0.047885
10 : N-HEXANE	0.282654	0	0.282609	0.000045	0.18509	0.043838
37 : METHYLCYCLOPENTA	0	0	0	0	0	0.035014
40 : BENZENE	0.011514	0	0.011513	0.000001744	0.00754	0.041693
38 : CYCLOHEXANE	0.02703	0	0.027027	0.000003239	0.0177	0.032991
79 : 2-METHYLHEXANE	0	0	0	0	0	0.014927
80 : 3-METHYLHEXANE	0	0	0	0	0	0.015009
11 : N-HEPTANE	0.34238	0	0.342363	0.00001705	0.2242	0.013707
39 : METHYLCYCLOHEXAN	0	0	0	0	0	0.011656
41 : TOLUENE	0.061146	0	0.061143	0.000002338	0.04004	0.010525
12 : N-OCTANE	0.181116	0	0.181113	0.00000288	0.1186	0.004377
45 : ETHYL BENZENE	0.010675	0	0.010674	1.557E-07	0.00699	0.004014
43 : M-XYLENE	0.049906	0	0.049906	0.000000611	0.03268	0.003371
42 : O-XYLENE	0	0	0	0	0	0.001707
13 : N-NONANE	0.068048	0	0.068048	3.507E-07	0.04456	0.001419
14 : N-DECANE	0.068323	0	0.068323	0.000000113	0.04474	0.000455
62 : WATER	151.185	0	0.000984	151.184	99	8.78485
Total	152.712	0	1.51366	151.198	100	

Flowrates

Component Name	Total lb/hr	Vapor lb/hr	Liquid 1 lb/hr	Liquid 2 lb/hr	Total mass %
46 : NITROGEN	0.008128	0	0.004812	0.003316	0.000284
49 : CARBON DIOXIDE	0.061158	0	0.012489	0.048669	0.002137
2 : METHANE	0.478965	0	0.327636	0.151329	0.016739
3 : ETHANE	0.858655	0	0.796799	0.061856	0.030008
4 : PROPANE	2.21874	0	2.16087	0.057878	0.07754
5 : ISOBUTANE	1.7698	0	1.76508	0.004717	0.06185
6 : N-BUTANE	4.51946	0	4.51093	0.00853	0.157944
9 : 2,2-DIMETHYLPROP	0	0	0	0	0
7 : ISOPENTANE	6.65349	0	6.64887	0.004626	0.232523
8 : N-PENTANE	8.18824	0	8.18371	0.004527	0.286158
54 : 2,2-DIMETHYLBUTA	0	0	0	0	0
55 : 2,3-DIMETHYLBUTA	0	0	0	0	0
52 : 2-METHYLPENTANE	0	0	0	0	0
53 : 3-METHYLPENTANE	0	0	0	0	0
10 : N-HEXANE	24.3569	0	24.353	0.003878	0.851211
37 : METHYLCYCLOPENTA	0	0	0	0	0
40 : BENZENE	0.899372	0	0.899236	0.000136	0.031431
38 : CYCLOHEXANE	2.27473	0	2.27446	0.000273	0.079496
79 : 2-METHYLHEXANE	0	0	0	0	0
80 : 3-METHYLHEXANE	0	0	0	0	0
11 : N-HEPTANE	34.3058	0	34.3041	0.001708	1.1989
39 : METHYLCYCLOHEXAN	0	0	0	0	0
41 : TOLUENE	5.63361	0	5.63339	0.000215	0.19688
12 : N-OCTANE	20.6878	0	20.6875	0.000329	0.722987
45 : ETHYL BENZENE	1.13321	0	1.13319	0.00001652	0.039603
43 : M-XYLENE	5.29804	0	5.29798	0.00006487	0.185153
42 : O-XYLENE	0	0	0	0	0
13 : N-NONANE	8.7272	0	8.72716	0.00004497	0.304994
14 : N-DECANE	9.72076	0	9.72074	0.00001608	0.339716
62 : WATER	2723.64	0	0.017729	2723.62	95.1844
Total	2861.44	0	137.46	2723.98	100

Flowrates

Component Name	Total ft3/hr	Vapor ft3/hr	Liquid 1 ft3/hr	Liquid 2 ft3/hr	Total volume %
46 : NITROGEN	0.000404	0	0.00037	0.00003422	0.000861
49 : CARBON DIOXIDE	0.000931	0	0.000612	0.00032	0.001982
2 : METHANE	0.046736	0	0.044009	0.002727	0.09949
3 : ETHANE	0.0577	0	0.057105	0.000595	0.12283
4 : PROPANE	0.105983	0	0.105604	0.000379	0.225614
5 : ISOBUTANE	0.065467	0	0.065444	0.00002347	0.139365
6 : N-BUTANE	0.167294	0	0.167252	0.00004243	0.356132
9 : 2,2-DIMETHYLPROP	0	0	0	0	0
7 : ISOPENTANE	0.198613	0	0.198594	0.00001854	0.422801
8 : N-PENTANE	0.244456	0	0.244438	0.00001814	0.520392
54 : 2,2-DIMETHYLBUTA	0	0	0	0	0
55 : 2,3-DIMETHYLBUTA	0	0	0	0	0
52 : 2-METHYLPENTANE	0	0	0	0	0
53 : 3-METHYLPENTANE	0	0	0	0	0
10 : N-HEXANE	0.609013	0	0.609	0.00001301	1.29645
37 : METHYLCYCLOPENTA	0	0	0	0	0
40 : BENZENE	0.024809	0	0.024809	5.041E-07	0.052814
38 : CYCLOHEXANE	0.058241	0	0.05824	9.364E-07	0.123983
79 : 2-METHYLHEXANE	0	0	0	0	0
80 : 3-METHYLHEXANE	0	0	0	0	0
11 : N-HEPTANE	0.737769	0	0.737764	0.000004929	1.57054
39 : METHYLCYCLOHEXAN	0	0	0	0	0
41 : TOLUENE	0.13176	0	0.131759	6.759E-07	0.280487
12 : N-OCTANE	0.390285	0	0.390284	8.326E-07	0.830829
45 : ETHYL BENZENE	0.023003	0	0.023002	0.000000045	0.048967
43 : M-XYLENE	0.107543	0	0.107542	1.767E-07	0.228934
42 : O-XYLENE	0	0	0	0	0
13 : N-NONANE	0.146638	0	0.146638	1.014E-07	0.312159
14 : N-DECANE	0.147231	0	0.147231	3.268E-08	0.313421
62 : WATER	43.7115	0	0.002121	43.7094	93.0519
Total	46.9754	0	3.26182	43.7136	100

Flowrates

Component Name	Total SCF/hr	Vapor SCF/hr	Liquid 1 SCF/hr	Liquid 2 SCF/hr	Total std vol %
46 : NITROGEN	0.000162	0	0.00009563	0.00006589	0.000344
49 : CARBON DIOXIDE	0.001193	0	0.000244	0.000949	0.002543
2 : METHANE	0.025611	0	0.017519	0.008092	0.054602
3 : ETHANE	0.03863	0	0.035847	0.002783	0.082357
4 : PROPANE	0.070118	0	0.068289	0.001829	0.149489
5 : ISOBUTANE	0.050411	0	0.050277	0.000134	0.107475
6 : N-BUTANE	0.124076	0	0.123842	0.000234	0.264525
9 : 2,2-DIMETHYLPROP	0	0	0	0	0
7 : ISOPENTANE	0.17081	0	0.170691	0.000119	0.364159
8 : N-PENTANE	0.20804	0	0.207925	0.000115	0.443534
54 : 2,2-DIMETHYLBUTA	0	0	0	0	0
55 : 2,3-DIMETHYLBUTA	0	0	0	0	0
52 : 2-METHYLPENTANE	0	0	0	0	0
53 : 3-METHYLPENTANE	0	0	0	0	0
10 : N-HEXANE	0.588167	0	0.588073	0.00009365	1.25395
37 : METHYLCYCLOPENTA	0	0	0	0	0
40 : BENZENE	0.016304	0	0.016301	0.000002469	0.034759
38 : CYCLOHEXANE	0.046555	0	0.046549	0.000005579	0.099253
79 : 2-METHYLHEXANE	0	0	0	0	0
80 : 3-METHYLHEXANE	0	0	0	0	0
11 : N-HEPTANE	0.799319	0	0.799279	0.0000398	1.70412
39 : METHYLCYCLOHEXAN	0	0	0	0	0
41 : TOLUENE	0.103614	0	0.10361	0.000003961	0.2209
12 : N-OCTANE	0.469223	0	0.469215	0.000007461	1.00036
45 : ETHYL BENZENE	0.020845	0	0.020845	0.000000304	0.044441
43 : M-XYLENE	0.097784	0	0.097783	0.000001197	0.208472
42 : O-XYLENE	0	0	0	0	0
13 : N-NONANE	0.193861	0	0.19386	0.000000999	0.413303
14 : N-DECANE	0.212344	0	0.212344	3.513E-07	0.45271
62 : WATER	43.6681	0	0.000284	43.6678	93.0987
Total	46.9052	0	3.22287	43.6823	100

Properties

Temperature	F	70
Pressure	psia	64.696
Enthalpy	Btu/hr	-2843916
Entropy	Btu/hr/R	-4541.953
Vapor Fraction		0

		Total	Liquid 1	Liquid 2
Flowrate	lbmol/hr	152.7117	1.5137	151.1981
Flowrate	lb/hr	2861.4364	137.4596	2723.9768
Mole Fraction		1	0.009912	0.990088
Mass Fraction		1	0.048039	0.951961
Molecular Weight		18.7375	90.8126	18.0159
Enthalpy	Btu/lbmol	-18622.7717	-12930.7458	-18679.7552
Enthalpy	Btu/lb	-993.8771	-142.3893	-1036.8456
Entropy	Btu/lbmol/R	-29.742	-15.2121	-29.8875
Entropy	Btu/lb/R	-1.5873	-0.167511	-1.6589
Cp	Btu/lbmol/R		45.3906	17.9945
Cp	Btu/lb/R		0.4998	0.9988
Cv	Btu/lbmol/R		38.6537	17.8586
Cv	Btu/lb/R		0.4256	0.9913
Cp/Cv			1.1743	1.0076
Density	lb/ft3		42.142	62.3142
Z-Factor			0.02453	0.003291
Flowrate (T-P)	gal/min		0.406694	5.4504
Flowrate (STP)	gal/min		0.401813	5.4461
Specific Gravity	GPA STP		0.68388	0.999876
Viscosity	cP		0.451565	0.975844
Thermal Conductivity	Btu/hr/ft/R		0.07224	0.347009
Surface Tension	dyne/cm		18.5519	72.5713
Reid Vapor Pressure (ASTM-A	psia		16.75	
True Vapor Pressure at 100 F	psia		70.24	
Critical Temperature (Cubic E	F	695.3231		
Critical Pressure (Cubic EOS)	psia	3180.1879		
Dew Point Temperature	F	294.9252		
Bubble Point Temperature	F	87.7395		
Water Dew Point	F	296.7697		
Liquid 2 Freezing Point	F	31.9383		
Stream Vapor Pressure	psia	57.464		
Latent Heat of Vaporization (N	Btu/lb	883.8845		
Latent Heat of Vaporization (P	Btu/lb	1105.365		
CO2 Freeze Up		No		
Heating Value (gross)	Btu/SCF	49.13		
Heating Value (net)	Btu/SCF	45.62		
Wobbe Number	Btu/SCF	60.59		
Average Hydrogen Atoms		2.1194		
Average Carbon Atoms		0.0634		
Hydrogen to Carbon Ratio		33.4296		

Details for Stream 2

Stream 2 (Flash Gas)

Thermodynamic Methods	K-Value:	PENG-ROB	Enthalpy:	PENG-ROB	Density:	STD
	Vapor Visc:	NBS81	Vapor ThC:	NBS81	Vapor Den:	STD

Flowrates

Component Name	Total lbmol/hr	Vapor lbmol/hr	Incipient Liquid 1 mol fra	Liquid 2 lbmol/hr	Total mole %	K-Value
46 : NITROGEN	0.000277	0.000277	0.000005308	0	0.296654	558.85
49 : CARBON DIOXIDE	0.000589	0.000589	0.000109	0	0.630879	57.6496
2 : METHANE	0.026762	0.026762	0.00145	0	28.6613	197.693
3 : ETHANE	0.018217	0.018217	0.006677	0	19.51	29.2214
4 : PROPANE	0.016818	0.016818	0.022742	0	18.0113	7.91968
5 : ISOBUTANE	0.005015	0.005015	0.0177	0	5.37102	3.0344
6 : N-BUTANE	0.009481	0.009481	0.047552	0	10.1541	2.13534
9 : 2,2-DIMETHYLPROP	0	0	0	0	0	1.48838
7 : ISOPENTANE	0.004418	0.004418	0.061223	0	4.73168	0.772861
8 : N-PENTANE	0.004352	0.004352	0.076112	0	4.66102	0.612388
54 : 2,2-DIMETHYLBUTA	0	0	0	0	0	0.360909
55 : 2,3-DIMETHYLBUTA	0	0	0	0	0	0.263381
52 : 2-METHYLPENTANE	0	0	0	0	0	0.236664
53 : 3-METHYLPENTANE	0	0	0	0	0	0.210746
10 : N-HEXANE	0.00316	0.00316	0.194983	0	3.38388	0.173547
37 : METHYLCYCLOPENTA	0	0	0	0	0	0.154099
40 : BENZENE	0.000123	0.000123	0.007947	0	0.1321	0.156231
38 : CYCLOHEXANE	0.000228	0.000228	0.018698	0	0.244474	0.130746
79 : 2-METHYLHEXANE	0	0	0	0	0	0.065693
80 : 3-METHYLHEXANE	0	0	0	0	0	0.066054
11 : N-HEPTANE	0.001182	0.001182	0.238054	0	1.2658	0.053173
39 : METHYLCYCLOHEXAN	0	0	0	0	0	0.051298
41 : TOLUENE	0.000164	0.000164	0.042548	0	0.175506	0.041249
12 : N-OCTANE	0.000197	0.000197	0.126232	0	0.210733	0.016694
45 : ETHYL BENZENE	0.00001073	0.00001073	0.00744	0	0.011493	0.015446
43 : M-XYLENE	0.00004215	0.00004215	0.034791	0	0.045146	0.012976
42 : O-XYLENE	0	0	0	0	0	0.007514
13 : N-NONANE	0.00002357	0.00002357	0.047463	0	0.025239	0.005318
14 : N-DECANE	0.000007444	0.000007444	0.047666	0	0.007972	0.001672
62 : WATER	0.002306	0.002306	0.000606	0	2.46969	40.7466
Total	0.093373	0.093373	1	0	100	

Flowrates

Component Name	Total lb/hr	Vapor lb/hr	Incipient Liquid 1 mass fra	Liquid 2 lb/hr	Total mass %
46 : NITROGEN	0.00776	0.00776	0.000002	0	0.2077
49 : CARBON DIOXIDE	0.025924	0.025924	0.000052	0	0.693914
2 : METHANE	0.429341	0.429341	0.000249	0	11.4922
3 : ETHANE	0.547751	0.547751	0.002147	0	14.6616
4 : PROPANE	0.741557	0.741557	0.01073	0	19.8492
5 : ISOBUTANE	0.291477	0.291477	0.011	0	7.80194
6 : N-BUTANE	0.551046	0.551046	0.02956	0	14.7498
9 : 2,2-DIMETHYLPROP	0	0	0	0	0
7 : ISOPENTANE	0.318749	0.318749	0.04725	0	8.53193
8 : N-PENTANE	0.313989	0.313989	0.05874	0	8.40454
54 : 2,2-DIMETHYLBUTA	0	0	0	0	0
55 : 2,3-DIMETHYLBUTA	0	0	0	0	0
52 : 2-METHYLPENTANE	0	0	0	0	0
53 : 3-METHYLPENTANE	0	0	0	0	0
10 : N-HEXANE	0.272272	0.272272	0.1797	0	7.28788
37 : METHYLCYCLOPENTA	0	0	0	0	0
40 : BENZENE	0.009634	0.009634	0.00664	0	0.257881
38 : CYCLOHEXANE	0.01921	0.01921	0.01683	0	0.514206
79 : 2-METHYLHEXANE	0	0	0	0	0
80 : 3-METHYLHEXANE	0	0	0	0	0
11 : N-HEPTANE	0.118426	0.118426	0.2552	0	3.1699
39 : METHYLCYCLOHEXAN	0	0	0	0	0
41 : TOLUENE	0.015099	0.015099	0.04193	0	0.404141
12 : N-OCTANE	0.022476	0.022476	0.1542	0	0.601604
45 : ETHYL BENZENE	0.001139	0.001139	0.008449	0	0.030493
43 : M-XYLENE	0.004475	0.004475	0.03951	0	0.119784
42 : O-XYLENE	0	0	0	0	0
13 : N-NONANE	0.003022	0.003022	0.06511	0	0.0809
14 : N-DECANE	0.001059	0.001059	0.07255	0	0.028348
62 : WATER	0.041544	0.041544	0.000117	0	1.112
Total	3.73595	3.73595	1	0	100
	Total VOC	**2.725174**			

Flowrates

Component Name	Total ft3/hr	Vapor ft3/hr	Liquid 1 ft3/hr	Liquid 2 ft3/hr	Total volume %
46 : NITROGEN	0.105789	0.105789	0	0	0.296654
49 : CARBON DIOXIDE	0.224976	0.224976	0	0	0.630879
2 : METHANE	10.2209	10.2209	0	0	28.6613
3 : ETHANE	6.95742	6.95742	0	0	19.51
4 : PROPANE	6.42295	6.42295	0	0	18.0113
5 : ISOBUTANE	1.91535	1.91535	0	0	5.37102
6 : N-BUTANE	3.62103	3.62103	0	0	10.1541
9 : 2,2-DIMETHYLPROP	0	0	0	0	0
7 : ISOPENTANE	1.68735	1.68735	0	0	4.73168
8 : N-PENTANE	1.66216	1.66216	0	0	4.66102
54 : 2,2-DIMETHYLBUTA	0	0	0	0	0
55 : 2,3-DIMETHYLBUTA	0	0	0	0	0
52 : 2-METHYLPENTANE	0	0	0	0	0
53 : 3-METHYLPENTANE	0	0	0	0	0
10 : N-HEXANE	1.20672	1.20672	0	0	3.38388
37 : METHYLCYCLOPENTA	0	0	0	0	0
40 : BENZENE	0.047108	0.047108	0	0	0.1321
38 : CYCLOHEXANE	0.087181	0.087181	0	0	0.244474
79 : 2-METHYLHEXANE	0	0	0	0	0
80 : 3-METHYLHEXANE	0	0	0	0	0
11 : N-HEPTANE	0.451395	0.451395	0	0	1.2658
39 : METHYLCYCLOHEXAN	0	0	0	0	0
41 : TOLUENE	0.062587	0.062587	0	0	0.175506
12 : N-OCTANE	0.075149	0.075149	0	0	0.210733
45 : ETHYL BENZENE	0.004098	0.004098	0	0	0.011493
43 : M-XYLENE	0.016099	0.016099	0	0	0.045146
42 : O-XYLENE	0	0	0	0	0
13 : N-NONANE	0.009	0.009	0	0	0.025239
14 : N-DECANE	0.002843	0.002843	0	0	0.007972
62 : WATER	0.880712	0.880712	0	0	2.46969
Total	**35.6608**	**35.6608**	0	0	100

Flowrates

Component Name	Total SCF/hr	Vapor SCF/hr	Liquid 1 SCF/hr	Liquid 2 SCF/hr	Total std vol %
46 : NITROGEN	0.105115	0.105115	0	0	0.296654
49 : CARBON DIOXIDE	0.223542	0.223542	0	0	0.630879
2 : METHANE	10.1557	10.1557	0	0	28.6613
3 : ETHANE	6.91308	6.91308	0	0	19.51
4 : PROPANE	6.38201	6.38201	0	0	18.0113
5 : ISOBUTANE	1.90314	1.90314	0	0	5.37102
6 : N-BUTANE	3.59795	3.59795	0	0	10.1541
9 : 2,2-DIMETHYLPROP	0	0	0	0	0
7 : ISOPENTANE	1.6766	1.6766	0	0	4.73168
8 : N-PENTANE	1.65156	1.65156	0	0	4.66102
54 : 2,2-DIMETHYLBUTA	0	0	0	0	0
55 : 2,3-DIMETHYLBUTA	0	0	0	0	0
52 : 2-METHYLPENTANE	0	0	0	0	0
53 : 3-METHYLPENTANE	0	0	0	0	0
10 : N-HEXANE	1.19903	1.19903	0	0	3.38388
37 : METHYLCYCLOPENTA	0	0	0	0	0
40 : BENZENE	0.046808	0.046808	0	0	0.1321
38 : CYCLOHEXANE	0.086626	0.086626	0	0	0.244474
79 : 2-METHYLHEXANE	0	0	0	0	0
80 : 3-METHYLHEXANE	0	0	0	0	0
11 : N-HEPTANE	0.448518	0.448518	0	0	1.2658
39 : METHYLCYCLOHEXAN	0	0	0	0	0
41 : TOLUENE	0.062188	0.062188	0	0	0.175506
12 : N-OCTANE	0.07467	0.07467	0	0	0.210733
45 : ETHYL BENZENE	0.004072	0.004072	0	0	0.011493
43 : M-XYLENE	0.015997	0.015997	0	0	0.045146
42 : O-XYLENE	0	0	0	0	0
13 : N-NONANE	0.008943	0.008943	0	0	0.025239
14 : N-DECANE	0.002825	0.002825	0	0	0.007972
62 : WATER	0.875099	0.875099	0	0	2.46969
Total	35.4335	35.4335	0	0	100

Properties

Temperature	F	70	
Pressure	psia	14.7	
Enthalpy	Btu/hr	53.20322	
Entropy	Btu/hr/R	0.4830613	
Vapor Fraction		1	
		Total	Vapor
Flowrate	lbmol/hr	0.093373	0.093373
Flowrate	lb/hr	3.7359	3.7359
Mole Fraction		1	1
Mass Fraction		1	1
Molecular Weight		**40.011**	**40.011**
Enthalpy	Btu/lbmol	569.7926	569.7926
Enthalpy	Btu/lb	14.2409	14.2409
Entropy	Btu/lbmol/R	5.1735	5.1735
Entropy	Btu/lb/R	0.129301	0.129301
Cp	Btu/lbmol/R		16.5723
Cp	Btu/lb/R		0.4142
Cv	Btu/lbmol/R		14.4942
Cv	Btu/lb/R		0.3623
Cp/Cv			1.1434
Density	lb/ft3		0.104764
Z-Factor			0.987829
Flowrate (T-P)	ft3/s		0.009906
Flowrate (STP)	MMSCFD		0.0008504
Viscosity	cP		0.009032
Thermal Conductivity	Btu/hr/ft/R		0.011621
Critical Temperature (Cubic E	F	238.1254	
Critical Pressure (Cubic EOS)	psia	1285.5034	
Dew Point Temperature	F	70	
Bubble Point Temperature	F	-245.897	
Water Dew Point	F	69.4937	
Stream Vapor Pressure	psia	964.1398	
Vapor Sonic Velocity	ft/s	855.72	
CO2 Freeze Up		No	
Heating Value (gross)	Btu/SCF	2242.86	
Heating Value (net)	**Btu/SCF**	**2061.35**	
Wobbe Number	Btu/SCF	1893.91	
Average Hydrogen Atoms		7.265	
Average Carbon Atoms		2.6651	
Hydrogen to Carbon Ratio		2.726	
Methane Number		39.56	
Motor Octane Number		97.7	

Details for Stream 3

Stream 3 (Produced Water)

Thermodynamic Methods	K-Value:	PENG-ROB	Enthalpy:	PENG-ROB	Density:	STD
	Liquid 1 Visc:	NBS81	Liquid 1 ThC:	NBS81	Liquid 1 Den:	STD
	Liquid 2 Visc:	STEAM	Liquid 2 ThC:	STEAM	Liquid 2 Den:	STD

Flowrates

Component Name	Total lbmol/hr	Vapor lbmol/hr	Liquid 1 lbmol/hr	Liquid 2 lbmol/hr	Total mole %	K-Value
46 : NITROGEN	0.00001316	0	0.000007608	0.00000555	0.000008621	
49 : CARBON DIOXIDE	0.000801	0	0.000157	0.000644	0.000525	
2 : METHANE	0.003093	0	0.002078	0.001015	0.002027	
3 : ETHANE	0.01034	0	0.009569	0.000771	0.006775	
4 : PROPANE	0.033501	0	0.032595	0.000906	0.021951	
5 : ISOBUTANE	0.025436	0	0.025369	0.0000671	0.016666	
6 : N-BUTANE	0.06828	0	0.068153	0.000127	0.044739	
9 : 2,2-DIMETHYLPROP	0	0	0	0	0	
7 : ISOPENTANE	0.087805	0	0.087745	0.00005911	0.057532	
8 : N-PENTANE	0.109143	0	0.109085	0.00005823	0.071514	
54 : 2,2-DIMETHYLBUTA	0	0	0	0	0	
55 : 2,3-DIMETHYLBUTA	0	0	0	0	0	
52 : 2-METHYLPENTANE	0	0	0	0	0	
53 : 3-METHYLPENTANE	0	0	0	0	0	
10 : N-HEXANE	0.279495	0	0.279452	0.00004227	0.183133	
37 : METHYLCYCLOPENTA	0	0	0	0	0	
40 : BENZENE	0.011391	0	0.011389	0.00000165	0.007464	
38 : CYCLOHEXANE	0.026802	0	0.026799	0.000003054	0.017561	
79 : 2-METHYLHEXANE	0	0	0	0	0	
80 : 3-METHYLHEXANE	0	0	0	0	0	
11 : N-HEPTANE	0.341198	0	0.341182	0.00001581	0.223563	
39 : METHYLCYCLOHEXAN	0	0	0	0	0	
41 : TOLUENE	0.060982	0	0.06098	0.000002193	0.039957	
12 : N-OCTANE	0.180919	0	0.180917	0.000002633	0.118544	
45 : ETHYL BENZENE	0.010664	0	0.010664	1.436E-07	0.006987	
43 : M-XYLENE	0.049864	0	0.049863	0.000000564	0.032672	
42 : O-XYLENE	0	0	0	0	0	
13 : N-NONANE	0.068025	0	0.068024	3.153E-07	0.044572	
14 : N-DECANE	0.068316	0	0.068316	9.959E-08	0.044762	
62 : WATER	151.182	0	0.000869	151.181	99.059	
Total	152.618	0	1.43321	151.185	100	

Flowrates

Component Name	Total lb/hr	Vapor lb/hr	Liquid 1 lb/hr	Liquid 2 lb/hr	Total mass %
46 : NITROGEN	0.000369	0	0.000213	0.000155	0.0000129
49 : CARBON DIOXIDE	0.035234	0	0.006902	0.028331	0.001233
2 : METHANE	0.049624	0	0.033335	0.016289	0.001737
3 : ETHANE	0.310903	0	0.287722	0.023182	0.010879
4 : PROPANE	1.47719	0	1.43723	0.039958	0.051691
5 : ISOBUTANE	1.47832	0	1.47442	0.0039	0.051731
6 : N-BUTANE	3.96841	0	3.96104	0.007373	0.138867
9 : 2,2-DIMETHYLPROP	0	0	0	0	0
7 : ISOPENTANE	6.33474	0	6.33048	0.004265	0.221673
8 : N-PENTANE	7.87425	0	7.87005	0.004201	0.275545
54 : 2,2-DIMETHYLBUTA	0	0	0	0	0
55 : 2,3-DIMETHYLBUTA	0	0	0	0	0
52 : 2-METHYLPENTANE	0	0	0	0	0
53 : 3-METHYLPENTANE	0	0	0	0	0
10 : N-HEXANE	24.0846	0	24.081	0.003643	0.842797
37 : METHYLCYCLOPENTA	0	0	0	0	0
40 : BENZENE	0.889738	0	0.889609	0.000129	0.031135
38 : CYCLOHEXANE	2.25552	0	2.25527	0.000257	0.078928
79 : 2-METHYLHEXANE	0	0	0	0	0
80 : 3-METHYLHEXANE	0	0	0	0	0
11 : N-HEPTANE	34.1873	0	34.1858	0.001584	1.19632
39 : METHYLCYCLOHEXAN	0	0	0	0	0
41 : TOLUENE	5.61851	0	5.6183	0.000202	0.196609
12 : N-OCTANE	20.6653	0	20.665	0.000301	0.723145
45 : ETHYL BENZENE	1.13207	0	1.13206	0.00001524	0.039615
43 : M-XYLENE	5.29357	0	5.29351	0.00005987	0.185239
42 : O-XYLENE	0	0	0	0	0
13 : N-NONANE	8.72418	0	8.72414	0.00004044	0.305287
14 : N-DECANE	9.7197	0	9.71968	0.00001417	0.340123
62 : WATER	2723.6	0	0.01565	2723.59	95.3074
Total	2857.7	0	133.981	2723.72	100

Flowrates

Component Name	Total ft3/hr	Vapor ft3/hr	Liquid 1 ft3/hr	Liquid 2 ft3/hr	Total volume %
46 : NITROGEN	0.00001829	0	0.00001668	0.000001605	0.00003903
49 : CARBON DIOXIDE	0.00053	0	0.000344	0.000186	0.001131
2 : METHANE	0.00485	0	0.004556	0.000294	0.01035
3 : ETHANE	0.021206	0	0.020983	0.000223	0.045254
4 : PROPANE	0.071735	0	0.071472	0.000262	0.153084
5 : ISOBUTANE	0.055647	0	0.055627	0.0000194	0.118752
6 : N-BUTANE	0.14948	0	0.149443	0.00003668	0.318996
9 : 2,2-DIMETHYLPROP	0	0	0	0	0
7 : ISOPENTANE	0.192422	0	0.192405	0.00001709	0.410637
8 : N-PENTANE	0.239215	0	0.239198	0.00001684	0.510494
54 : 2,2-DIMETHYLBUTA	0	0	0	0	0
55 : 2,3-DIMETHYLBUTA	0	0	0	0	0
52 : 2-METHYLPENTANE	0	0	0	0	0
53 : 3-METHYLPENTANE	0	0	0	0	0
10 : N-HEXANE	0.612785	0	0.612773	0.00001222	1.30771
37 : METHYLCYCLOPENTA	0	0	0	0	0
40 : BENZENE	0.024975	0	0.024974	4.772E-07	0.053297
38 : CYCLOHEXANE	0.058764	0	0.058763	8.831E-07	0.125405
79 : 2-METHYLHEXANE	0	0	0	0	0
80 : 3-METHYLHEXANE	0	0	0	0	0
11 : N-HEPTANE	0.748137	0	0.748132	0.000004573	1.59655
39 : METHYLCYCLOHEXAN	0	0	0	0	0
41 : TOLUENE	0.133715	0	0.133714	0.000000634	0.285353
12 : N-OCTANE	0.396709	0	0.396708	7.612E-07	0.846593
45 : ETHYL BENZENE	0.023383	0	0.023383	4.152E-08	0.0499
43 : M-XYLENE	0.109339	0	0.109339	1.631E-07	0.233334
42 : O-XYLENE	0	0	0	0	0
13 : N-NONANE	0.149162	0	0.149162	9.117E-08	0.318317
14 : N-DECANE	0.1498	0	0.1498	2.88E-08	0.31968
62 : WATER	43.7176	0	0.001905	43.7157	93.2951
Total	46.8594	0	3.1427	43.7167	100

Flowrates

Component Name	Total SCF/hr	Vapor SCF/hr	Liquid 1 SCF/hr	Liquid 2 SCF/hr	Total std vol %
46 : NITROGEN	0.000007325	0	0.000004235	0.00000309	0.00001566
49 : CARBON DIOXIDE	0.000687	0	0.000135	0.000553	0.001469
2 : METHANE	0.002654	0	0.001782	0.000871	0.005672
3 : ETHANE	0.013987	0	0.012944	0.001043	0.029898
4 : PROPANE	0.046683	0	0.04542	0.001263	0.099788
5 : ISOBUTANE	0.042109	0	0.041998	0.000111	0.09001
6 : N-BUTANE	0.108948	0	0.108745	0.000202	0.232882
9 : 2,2-DIMETHYLPROP	0	0	0	0	0
7 : ISOPENTANE	0.162627	0	0.162517	0.000109	0.347624
8 : N-PENTANE	0.200063	0	0.199956	0.000107	0.427646
54 : 2,2-DIMETHYLBUTA	0	0	0	0	0
55 : 2,3-DIMETHYLBUTA	0	0	0	0	0
52 : 2-METHYLPENTANE	0	0	0	0	0
53 : 3-METHYLPENTANE	0	0	0	0	0
10 : N-HEXANE	0.581592	0	0.581504	0.00008797	1.24319
37 : METHYLCYCLOPENTA	0	0	0	0	0
40 : BENZENE	0.016129	0	0.016127	0.000002337	0.034477
38 : CYCLOHEXANE	0.046162	0	0.046156	0.00000526	0.098673
79 : 2-METHYLHEXANE	0	0	0	0	0
80 : 3-METHYLHEXANE	0	0	0	0	0
11 : N-HEPTANE	0.796559	0	0.796522	0.00003692	1.70269
39 : METHYLCYCLOHEXAN	0	0	0	0	0
41 : TOLUENE	0.103336	0	0.103332	0.000003715	0.220887
12 : N-OCTANE	0.468713	0	0.468706	0.00000682	1.0019
45 : ETHYL BENZENE	0.020824	0	0.020824	2.804E-07	0.044513
43 : M-XYLENE	0.097701	0	0.0977	0.000001105	0.208843
42 : O-XYLENE	0	0	0	0	0
13 : N-NONANE	0.193794	0	0.193793	8.983E-07	0.414245
14 : N-DECANE	0.212321	0	0.212321	3.095E-07	0.453849
62 : WATER	43.6674	0	0.000251	43.6672	93.3417
Total	46.7823	0	3.11074	43.6716	100

Properties

Temperature	F	70
Pressure	psia	14.7
Enthalpy	Btu/hr	-2843808
Entropy	Btu/hr/R	-4541.196
Vapor Fraction		0

		Total	Liquid 1	Liquid 2
Flowrate	lbmol/hr	152.6184	1.4332	151.1852
Flowrate	lb/hr	2857.7005	133.9813	2723.7191
Mole Fraction		1	0.009391	0.990609
Mass Fraction		1	0.046884	0.953116
Molecular Weight		18.7245	93.4832	18.0158
Enthalpy	Btu/lbmol	-18633.4603	-13330.731	-18683.7294
Enthalpy	Btu/lb	-995.1388	-142.6002	-1037.0756
Entropy	Btu/lbmol/R	-29.7552	-15.5869	-29.8895
Entropy	Btu/lb/R	-1.5891	-0.166734	-1.6591
Cp	Btu/lbmol/R		46.3621	17.9991
Cp	Btu/lb/R		0.4959	0.9991
Cv	Btu/lbmol/R		39.6185	17.8638
Cv	Btu/lb/R		0.4238	0.9916
Cp/Cv			1.1702	1.0076
Density	lb/ft3		42.6326	62.3038
Z-Factor			0.005672	0.0007479
Flowrate (T-P)	gal/min		0.391842	5.4507
Flowrate (STP)	gal/min		0.387832	5.4448
Specific Gravity	GPA STP		0.690603	1
Viscosity	cP		0.459256	0.975963
Thermal Conductivity	Btu/hr/ft/R		0.070854	0.346918
Surface Tension	dyne/cm		19.4328	72.5713
Reid Vapor Pressure (ASTM-A)		unconverged		
True Vapor Pressure at 100 F	psia		21.1	
Critical Temperature (Cubic E	F	695.6308		
Critical Pressure (Cubic EOS)	psia	3176.7305		
Dew Point Temperature	F	211.56		
Bubble Point Temperature	F	70.2894		
Water Dew Point Temperature could not be calculated				
Liquid 2 Freezing Point	F	31.986		
Stream Vapor Pressure	psia	14.7		
Latent Heat of Vaporization (N	Btu/lb	935.0835		
Latent Heat of Vaporization (P	Btu/lb	1073.389		
CO2 Freeze Up		No		
Heating Value (gross)	Btu/SCF	47.79		
Heating Value (net)	Btu/SCF	44.39		
Wobbe Number	Btu/SCF	58.95		
Average Hydrogen Atoms		2.1163		
Average Carbon Atoms		0.0618		
Hydrogen to Carbon Ratio		34.2396		

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	TK-AF
City:	Corpus Christi
State:	Texas
Company:	
Type of Tank:	Horizontal Tank
Description:	300 Gal Anitfreeze Tank

Tank Dimensions

Shell Length (ft):	6.00
Diameter (ft):	3.00
Volume (gallons):	300.00
Turnovers:	12.00
Net Throughput(gal/yr):	3,600.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Corpus Christi, Texas (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

TK-AF - Horizontal Tank
Corpus Christi, Texas

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Methyl alcohol	All	73.50	68.36	78.64	71.57	2.1786	1.8675	2.5329	32.0400			32.04	Option 2: A=7.897, B=1474.08, C=229.13

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

TK-AF - Horizontal Tank
Corpus Christi, Texas

Annual Emission Calcaulations

Standing Losses (lb):	8.9090
Vapor Space Volume (cu ft):	27.0137
Vapor Density (lb/cu ft):	0.0122
Vapor Space Expansion Factor:	0.0869
Vented Vapor Saturation Factor:	0.6524
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	27.0137
Tank Diameter (ft):	3.0000
Effective Diameter (ft):	4.7885
Vapor Space Outage (ft):	1.5000
Tank Shell Length (ft):	6.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0122
Vapor Molecular Weight (lb/lb-mole):	32.0400
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	2.1786
Daily Avg. Liquid Surface Temp. (deg. R):	533.1716
Daily Average Ambient Temp. (deg. F):	71.5458
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	531.2358
Tank Paint Solar Absorptance (Shell):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,447.9410
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0869
Daily Vapor Temperature Range (deg. R):	20.5542
Daily Vapor Pressure Range (psia):	0.6654
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	2.1786
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	1.8675
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	2.5329
Daily Avg. Liquid Surface Temp. (deg R):	533.1716
Daily Min. Liquid Surface Temp. (deg R):	528.0331
Daily Max. Liquid Surface Temp. (deg R):	538.3102
Daily Ambient Temp. Range (deg. R):	18.9750
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.6524
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	2.1786
Vapor Space Outage (ft):	1.5000
Working Losses (lb):	5.9832
Vapor Molecular Weight (lb/lb-mole):	32.0400
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	2.1786
Annual Net Throughput (gal/yr.):	3,600.0000
Annual Turnovers:	12.0000
Turnover Factor:	1.0000
Tank Diameter (ft):	3.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	14.8921

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

TK-AF - Horizontal Tank
Corpus Christi, Texas

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Methyl alcohol	5.98	8.91	14.89

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	TK-LO
City:	Corpus Christi
State:	Texas
Company:	
Type of Tank:	Horizontal Tank
Description:	500 Gal Lube Oil Tank

Tank Dimensions

Shell Length (ft):		6.00
Diameter (ft):		4.00
Volume (gallons):		500.00
Turnovers:		12.00
Net Throughput(gal/yr):		6,000.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Corpus Christi, Texas (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

TK-LO - Horizontal Tank
Corpus Christi, Texas

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
LUBE OIL	All	73.50	68.36	78.64	71.57	0.0001	0.0001	0.0001	190.0000			387.00	Option 1: VP70 = .0001 VP80 = .0001

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

TK-LO - Horizontal Tank
Corpus Christi, Texas

Annual Emission Calcaulations	
Standing Losses (lb):	0.0020
Vapor Space Volume (cu ft):	48.0243
Vapor Density (lb/cu ft):	0.0000
Vapor Space Expansion Factor:	0.0345
Vented Vapor Saturation Factor:	1.0000
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	48.0243
Tank Diameter (ft):	4.0000
Effective Diameter (ft):	5.5293
Vapor Space Outage (ft):	2.0000
Tank Shell Length (ft):	6.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0000
Vapor Molecular Weight (lb/lb-mole):	190.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0001
Daily Avg. Liquid Surface Temp. (deg. R):	533.1716
Daily Average Ambient Temp. (deg. F):	71.5458
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	531.2358
Tank Paint Solar Absorptance (Shell):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,447.9410
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0345
Daily Vapor Temperature Range (deg. R):	20.5542
Daily Vapor Pressure Range (psia):	0.0000
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0001
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0001
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0001
Daily Avg. Liquid Surface Temp. (deg R):	533.1716
Daily Min. Liquid Surface Temp. (deg R):	528.0331
Daily Max. Liquid Surface Temp. (deg R):	538.3102
Daily Ambient Temp. Range (deg. R):	18.9750
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	1.0000
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0001
Vapor Space Outage (ft):	2.0000
Working Losses (lb):	0.0027
Vapor Molecular Weight (lb/lb-mole):	190.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0001
Annual Net Throughput (gal/yr.):	6,000.0000
Annual Turnovers:	12.0000
Turnover Factor:	1.0000
Tank Diameter (ft):	4.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	0.0047

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

TK-LO - Horizontal Tank
Corpus Christi, Texas

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
LUBE OIL	0.00	0.00	0.00

ATTACHMENT 4
REGULATORY APPLICABILITY

OIL AND GAS STANDARD PERMIT REGISTRATION

DEWITT CENTRAL FACILITY 3

BURLINGTON RESOURCES OIL & GAS COMPANY LP

ATTACHMENT 4
REGULATORY APPLICABILITY

Burlington Resources Oil & Gas Company LP (Burlington) is submitting this Oil and Gas Standard Permit (SP) Registration to authorize DeWitt Central Facility 3 (the Site). The Site will include one (1) compressor engine and associated blowdown and starter vent event, two (2) controlled atmospheric condensate storage tanks and associated loading, one (1) controlled atmospheric produced water storage tank and associated loading, one (1) controlled atmospheric slop storage tank and associated loading, one (1) flare combustion control device, and piping and fugitive components. The following paragraphs address the Site's compliance with each of the applicable SP requirements.

Non-Rule Air Quality Standard Permit for Oil and Gas Handling and Production Facilities, effective February 27, 2011.

SP (a)(1)

This rule states that the requirements in paragraphs (a)-(k) of this standard permit are applicable to projects located in the Barnett Shale (Archer, Bosque, Clay, Comanche, Cooke, Coryell, Dallas, Denton, Eastland, Ellis, Erath, Hill, Hood, Jack, Johnson, Montague, Palo Pinto, Parker, Shackelford, Stephens, Somervell, Tarrant, and Wise Counties) on or after April 1, 2011. For all other projects and dependent facilities, 30 TAC 116.620 is applicable.

The Site is located in Dewitt County and is therefore not required to meet this SP. However, Burlington has opted to meet the Non-Rule Air Quality Standard Permit voluntarily.

SP (a)(2)

This rule states that only one Air Quality Standard Permit for Oil and Gas Handling and Production Facilities for an oil and gas site (OGS) may be registered for a combination of dependent facilities, and may not be used if operationally dependent facilities are authorized by the permit by rule in 30 TAC 106.352 or 116.111. Existing authorized facilities which are not changing certified character or quantity of emissions must only meet subsections (i) and (k) of this standard permit.

All facilities at the Site are included in this SP registration, in accordance with this rule.

SP (a)(3)

This rule does not relieve the owner or operator from complying with any other applicable provision of the Texas Health and Safety Code, Texas Water Code, rules of the Texas Commission on Environmental Quality (TCEQ), or any additional local, state, or federal regulations.

Burlington will comply with the applicable provisions of these regulations.

SP (a)(4)

This rule states that emissions from upsets, emergencies, or malfunctions are not authorized by this standard permit. This standard permit does not regulate methane, ethane, or carbon dioxide.

This SP registration does not include emissions from upset, emergency, or malfunction events. If any such emission events occur, Burlington Resources will manage them in accordance with 30 TAC Chapter 101.

SP (b)(1)-(8)

These rules state the definitions and scope of a Facility, Receptors, and OGS. The rules also state that the definitions of 30 TAC §122.10 relating to the Federal Operating Permits program apply. A project is defined as any new facility or group of operationally dependent facilities at an OGS or physical or operational changes to existing authorized facilities which increase the potential to emit over previously certified limits and must meet all requirements of this standard permit prior to construction or implementation of changes, including an impacts analysis as specified in paragraph (k) of this SP.

This permit application was completed according to the definitions and scope laid out in these rules.

SP (c)(1)

This rule states that existing OGS which are authorized by previous versions of this Standard Permit require registration unless the Project can meet exceptions listed in this requirement.

This Site was not authorized under a previous SP; therefore, this rule does not apply.

SP (c)(2)(A)

This rule states that new, changed, or replacement facilities shall not exceed the thresholds for major source or major modification as defined in 30 TAC §116.12 (Nonattainment and Prevention of Significant Deterioration Review Definitions), and in Federal Clean Air Act, §112(g) or §112(j);

The Site is located in Dewitt County which is an attainment county. The Site is a new project and emission totals for the Site do not exceed the thresholds for a major source. Therefore the requirements of this rule have been met.

SP (c)(2)(B)

This rule states that all facilities shall comply with all applicable 40 Code of Federal Regulations (CFR), Parts 60, 61, and 63 requirements for New Source Performance Standards (NSPS), National Emission Standards for Hazardous Air Pollutants (NESHAP), and Maximum Achievable Control Technology (MACT).

NSPS Kb – Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced after July 23, 1984 does not apply to the Site's storage tanks due to their capacities and since the condensate is only stored prior to custody transfer.

NSPS KKK – Standards of Performance for Equipment Leaks of VOC From Onshore Natural Gas Processing Plants do not apply since the Site is not a natural gas processing plant.

NSPS LLL – Standards of Performance for Onshore Natural Gas Processing: SO_2 Emissions does not apply since the Site does not have a sweetening unit or sweetening unit followed by a sulfur recovery unit.

NSPS OOOO – Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution: The emission sources affected by this subpart include well completions, pneumatic controllers, equipment leaks from natural gas processing plants, sweetening units at natural gas processing plants, reciprocating compressors, centrifugal compressors and storage vessels which are constructed, modified or reconstructed after August 23, 2011.

Pneumatic controllers affected by NSPS OOOO include continuous bleed, natural gas-driven pneumatic controllers with a natural gas bleed rate greater than 6 SCFH that commenced construction, modification or reconstruction after August 23, 2011.

Standards also apply to storage vessels constructed, modified or reconstructed after August 23, 2011, with VOC emissions equal to or greater than 6 tons per year (TPY). The proposed pressurized product storage tanks have an uncontrolled potential to emit greater than 6 TPY of VOC emissions and were constructed after August 23, 2011; therefore, they are subject to this subpart. The tank's vent system is routed to the flare; therefore, a minimum of 98% control efficiency is achieved.

Reciprocating compressors located at the Site are adjacent to other well sites and servicing more than one well site; therefore, standards affecting this facility do not apply.

The Site will comply with the applicable requirements for natural gas well facilities.

MACT Subpart ZZZZ- COMP-01 is existing RICE because it was constructed before June 12, 2006., according to §63.6590(c)(1) in the amended regulation. The Site will comply with the requirements of this rule.

MACT Subpart HH - National Emission Standards for Hazardous Air Pollutants from Oil and Natural Gas Production Facilities. According to 40 CFR §63.764(e)(1)(ii), since the actual average emissions of benzene from the glycol dehydration unit are below 0.9 megagram per year the unit is subject to limited requirements in this rule. These requirements include keeping on-site records of benzene emission determinations and the natural gas flowrates for the dehydration unit.

The Site is not subject to any Hazardous Air Pollutant (HAP) control requirements listed in 40 CFR Part 61.

SP (c)(2)(D)

This rule states that all facilities shall comply with all applicable requirements of 30 TAC Chapters 111 (Control of Air Pollution from Visible Emissions and Particulate Matter), 112 (Control of Air Pollution from Sulfur Compounds), 113 (Standards of Performance for Hazardous Air Pollutants and for Designated Facilities and Pollutants), 115 (Control of Air Pollution from Volatile Organic Compounds), and 117 (Control of Air Pollution from Nitrogen Compounds).

Explanations of compliance are provided for all applicable rules.

30 TAC Chapter 111 - Control of Air Pollution from Visible Emissions and Particulate Matter Flare control devices found at the site will meet the visible emission requirements listed in 30 TAC 111.111(a)(4). This includes stipulations on visible emissions allowed during periods of time during normal operations.

30 TAC Chapter 112 - Control of Air Pollution from Sulfur Compounds regulates controls needed

on emissions related to sulfur compounds. The liquids and gases handled on site do not emit over the prescribed rates.

30 TAC Chapter 113 - Standards of Performance for Hazardous Air Pollutants and for Designated Facilities and Pollutants addresses the control of hazardous air pollutant (HAP) emissions from designated facilities defined within this chapter including municipal solid waste landfills (MSWLFs), medical waste incinerators, and certain other processes/emissions regulated under 40 CFR Parts 61 and 63. The Site will not generate radionuclide emissions and will not include a MSWLF or medical waste incinerator. Consequently, Subchapters B and D are not applicable. The applicability of Subchapter C of this rule, which implements 40 CFR Part 63 by regulating HAP emissions released from source categories, is discussed above under section (c)(2)(B) of the Non-Rule SP.

30 TAC Chapter 115 - Control of Air Pollution from Volatile Organic Compounds regulates VOC emissions according to source type and Site location (county). The Site is located in Dewitt County which is considered a covered attainment county. However, the equipment at the Site is exempt from this rule because it does not meet the requirements set forth for applicability for covered attainment counties.

30 TAC Chapter 117 - Control of Air Pollution from Nitrogen Compounds includes regulations for major sources of NO_X in ozone nonattainment areas. The Site is located in Dewitt County, which is not listed in the counties of interest as mentioned in this rule text. NOx emitting sources at the Site are exempt from this rule and it's requirements.

SP (c)(3)

This rule states that in order to be eligible for this Standard Permit, an applicant:
(A) shall meet all applicable requirements as set forth in this standard permit;
(B) shall not misrepresent all relevant facts in obtaining the permit; and
(C) shall not be indebted to the state for failure to make payment of penalties or taxes imposed by the commission's jurisdiction.

Burlington will comply with the requirements listed in this rule.

SP (c)(4)(A-D)

All facilities related to the operation of any OGS, under any version of this standard permit (or co-located at a site with an OGS standard permit), previously authorized by permit by rule under 30 TAC Chapter 106 must be incorporated into this standard permit (previous authorizations will be voided), meet all emission limits established by this standard permit and review in accordance with paragraph (b)(8), and meet the requirements of paragraphs (e), (i), and (j) of this standard permit. The requirements in paragraph (h) (BACT) of this standard permit must be met if facilities are changed to increase the potential to emit.

The Site was not previously authorized under any Standard Permits. However, a Permit By Rule (PBR) Permit Number 103471 was submitted for this site last year.

SP (d)

This rule lists the specific facilities that have been evaluated for standard permit registration, as well as facilities that are not authorized under standard permit.

The Site does not include any of the facilities listed in the exclusions list of this rule. Additionally, all the facilities located at the Site are listed in the approved facilities list of this rule. Therefore, the requirements of this rule will be met.

SP (e)(1)

All facilities which have the potential to emit air contaminants must be maintained in good working order and operated properly during facility operations. Each operator shall establish and maintain a program to replace, repair, and/or maintain facilities to keep them in good working order. The minimum requirements of this program shall include:

(A) Compliance with manufacturer's specifications and recommended programs;
(B) cleaning and routine inspection of all equipment; and
(C) replacement and repair of equipment on schedules which prevent equipment failures and maintain performance.

Burlington will comply with the requirements of this rule.

SP (e)(2)

This rule states that any facility shall be operated at least 50 feet from any property line or receptor (whichever is closer to the facility). This distance limitation does not apply to the following:

(A) any fugitive components that are used for isolation and/or safety purposes may be located at 1/2 of the width of any applicable easement;
(B) any facility at a location for which the distance requirements were satisfied at the time this section is claimed, registered, or certified (provided that the authorization was maintained) regardless of whether a receptor is subsequently built or put to use 50 feet from any OGS facility; or
(C) existing facilities which are located less than 50 feet from a property line or receptor when constructed and previously authorized. If modified or replaced the operator shall consider, to the extent that good engineering practice will permit, moving these facilities to meet the 50-foot requirement. Replacement facilities must meet all other requirements of this section.

The Site will satisfy the 50-foot requirement.

SP (e)(3)

This rule states that engines and turbines shall meet the emission and performance standards listed in Table 6 and the following requirements:

(A) liquid fueled engines used for back-up power generation and periodic power needs at the OGS are authorized if the fuel has no more than 0.05% sulfur and the engine is operated less than 876 hours per rolling 12-month period;
(B) engines and turbines used for electric generation more than 876 hours per rolling 12-month period are authorized if no reliable electric service is readily available and 30 TAC §106.352(m) Table 6 is met. In all other circumstances, electric generators must meet the technical requirements of the Air Quality Standard Permit for Electric Generating Unit (EGU) and the emissions shall be included in the registration under this section;
(C) all applicable requirements of Chapter 117 of this title (relating to Control of Air Pollution from Nitrogen Compounds);
(D) all applicable requirements of 40 CFR Parts 60 and 63; and

(E) compression ignition engines that are rated less than 225 kilowatts (300 hp) and emit less than or equal to the emission tier for an equivalent-sized model year 2008 non-road compression ignition engine located at 40 CFR §89.112, Table 1 are authorized.

Burlington will comply with this section.

SP (e)(4)

This rule states that open-topped tanks or ponds containing VOCs or H_2S are allowed up to a potential to emit equal to 1.0 tpy of VOC and 0.1 tpy of H_2S.

This Site does not involve open-topped tanks or ponds containing VOCs or H_2S. Therefore, this rule does not apply.

SP (e)(5)

All process equipment and storage facilities individually must meet the requirements of BACT listed in Table 10 in paragraph (m). Any combination of process equipment and storage facilities with an uncontrolled PTE of equal to or greater than 25 tpy of VOC must also meet the requirements of Table 10, row titled "Combined Control Requirements". All of the following streams and facilities must be included for this site-wide assessment:

(A) For any gaseous vent stream with a concentration of 1% VOC must be considered for capture and control requirements;

(B) For any liquid stream with a potential to emit of equal to or greater than 1 tpy VOC for each vessel or storage facility.

The equipment at the Site will meet the requirements of this rule.

SP (e)(6)

This rule includes requirements for fugitive components based upon the total site fugitive emissions. If the site is subject to LDAR control program, the requirements outlined in Table 9 must be followed.

The emissions represented in this application are done so in accordance with this rule. This Site is not required to utilize the LDAR control program.

SP (e)(7)

This rule states requirements for tanks and vessels that use a paint color to minimize the effects of solar heating. Solar absorptance should be 0.43 or less, as referenced in AP-42 Table 7.1 – 6 and paint shall be applied in sufficient quantity as to be considered solar resistant. Paint coatings shall be maintained in good condition and will not compromise tank integrity. Minimal amounts of rust may be present not to exceed 10% of the external surface area of the roof or walls of the tank and in no way may compromise tank integrity.

The Site includes a number of liquid storage tanks which will comply with the requirements of this rule.

SP (e)(8)

This rule states that all emission estimation methods including computer programs must be used with monitoring data generated in accordance with Table 8 in section (m). All emission estimation methods must also be used in a way that are consistent with protocols established by the commission or promulgated in federal regulations (NSPS, NESHAPS). Where control is relied upon to meet paragraph (k) (emission limits based on impact evaluation), control monitoring is required.

The Site will comply with all applicable monitoring and record demonstration requirements, and all emission estimation methods will comply with the requirements of this rule.

SP (e)(9)

This rule states that process reboilers, heaters, and furnaces that are also used for control of waste gas streams:

(A) may claim 50% to 99% destruction efficiency for VOCs and H_2S depending on the design and level of monitoring applied. The 90% destruction may be claimed where the waste gas is delivered to the flame zone or combustion fire box with basic monitoring as specified in 30 TAC §106.352(j). Any value greater than 90% and up to 99% destruction efficiency may be claimed where enhanced monitoring and/or testing are applied as specified in 30 TAC §106.352(j);
(B) if the waste gas is premixed with the primary fuel gas and used as the primary fuel in the device through the primary fuel burners, 99% destruction may be claimed with basic monitoring as specified in 30 TAC §106.352(j);
(C) in systems where the combustion device is designed to cycle on and off, records of run time and enhanced monitoring are required to claim any run time beyond 50%.

There are no heaters at the Site; therefore, this rule does not apply.

SP (e)(10)

This rule states that Vapor Recovery Systems (VRSs) may claim up to 100% control. The VRUs must meet the appropriate design, monitoring, and recordkeeping in subsection (m) Table 7 and Table 8.

The Site does not involve the use of a VRU; therefore, this rule does not apply.

SP (e)(11)

This rule includes design parameters that are required of flare combustion ctorl devices in order to be able to claim a 98% destruction efficiency of 98% for VOCs and H2S and 99% for VOCs containing no more than three carbon atoms that contain no elements other than carbon and hydrogen.

The Site has a flare combustion control device and is claiming a destruction efficiency of 98%. The Site will meet the design parameters required for this destruction efficiency.

SP (e)(12)

This rule establishes the design destruction efficiency that thermal oxidation and vapor combustion control devices may claim, depending on the design and level of monitoring applied, variability of waste gas streams to control, and stack testing.

The Site does not involve the use of thermal oxidizers; therefore, this rule does not apply.

SP (f)(1)

This rule states that for all previous claims of this standard permit (or previous version of this standard permit) existing authorized facilities, or group of facilities, are not required to meet the requirements of this standard permit, with the exception of planned MSS, until a renewal under the standard permit is submitted after December 31, 2015.

The Site is not an existing authorized facility under a previous version of the SP; therefore, this rule does not apply.

SP (f)(2)

This rule states that if no other changes, except for authorizing planned MSS, occur at an existing site under this standard permit, or any previous version of this standard permit, paragraph (b)(7) applies.
(A) Records demonstrating compliance Paragraph (i) must be kept;
(B) If the OGS must certify emissions to establish nonapplicability of prevention of significant deterioration (PSD), nonattainment new source review (NNSR), or the federal operating permits program, this certification may be filed using form APD-CERT. No fee is required for this certification;
(C) Planned MSS shall be incorporated at the next revision or update to a registration under this standard permit after January 5, 2012, and no later than any renewal submitted after December 31, 2015.

The Site is not an existing authorized facility under this SP or a previous version of the SP; therefore, this rule does not apply.

SP (f)(3)

This rule states that facilities, groups of facilities or planned MSS from facilities registered under this standard permit cannot be authorized by a permit under 30 TAC 116.111, General Application.

This registration includes planned MSS emissions authorized under the Non-Rule Oil & Gas Standard Permit.

SP (f)(4)

This rule states that prior to construction or implementation of changes for any project which meets this standard permit, a notification shall be submitted through the ePermits system (or hard copy). This notification shall include the following:
(A) Identifying information (Core Data) and a general description of the project.
(B) A fee of $25 for small businesses as defined in 30 TAC §106.50 (Registration Fees for Permits by Rule), or $50 for all others.

An initial notification meeting these requirements was submitted to the TCEQ via the ePermits system on May 6, 2013 along with the $50 fee, as required by this rule.

SP (f)(5)

This rule states that for any registration which meets the emission limitations of this standard permit must meet the following:
(A) Within 90 days after start of operation or implemented changes (whichever occurs first), the facilities must be registered with a PI-1S Standard Permit Application.

(B) Include a detailed summary of maximum emissions estimates based on representative gas and liquid analysis, equipment design specifications and operations, material type and throughput, other parameters for determining emissions, and documentation demonstrating compliance with applicable requirements.
(C) Pay registration fee of $475 for small businesses, or $850 for all others.
(D) Construction may begin any time after receipt of written notification to the executive director. Operations may continue after receipt of registration if there are no objections or 45 days after receipt by the executive director of the registration, whichever occurs first.

This SP registration is being submitted in accordance with these requirements.
SP (f)(6)

This rule states that if an OGS emissions increase, either through a change in production or addition of facilities, the site may change authorization (Level 1 or Level 2 PBR in 30 TAC §106.352 or Standard Permit) within 90 days from the initial notification of construction of an oil and gas facility or within 90 days of the change of production or installation of additional equipment, by submitting an initial registration or revision to the PBR or Standard Permit.

At the time of this registration, Burlington maintains that the Site should be permitted under the SP level.

SP (f)(7)

This rule states that all registrations, registration revisions, and renewals shall be submitted to the commission through a PI-1S Standard Permit Registration Form. Fee requirements do not apply when there are changes in representations with no increase in emissions within 6-months after a standard permit registration has been issued.

A PI-1S Standard Permit Registration Form is part of this initial SP registration; therefore, the requirements of this rule will be met.

SP (g)

This rule states that any claim under this standard permit must comply with all applicable requirements of 30 TAC §116.610; §116.611, Registration to Use a Standard Permit; §116.614, Standard Permit Fees; and §116.615, General Conditions. This standard permit supersedes: the notification requirements of 30 TAC §116.615, General Conditions; and the emission limitations of 30 TAC §116.610(a)(1), Applicability.

This SP registration complies with all applicable requirements as listed in this rule and discussed later in this section; therefore, the requirements of this rule will be met.

SP (h)

Total maximum estimated registered or certified emissions shall meet the most stringent of the following:
(1) The applicable limits for a major stationary source or major modification for PSD and NNSR as specified in 30 TAC §116.12.
(2) Paragraph (k) of this standard permit.
(3) The limits set forth by Paragraph (h)(3).

The Site complies with this rule. Refer to Attachment 5 for the Impacts Evaluation.

SP (i)(1)

This rule states that prior to January 5, 2012, representations and registration of planned MSS is voluntary, but if represented must meet the applicable limits of the standard permit. After January 5, 2012, all emissions from planned MSS activities and facilities must be considered for compliance with applicable limits of the standard permit unless otherwise stated in (b)(7). This section may not be used at a site or for facilities authorized under §116.111 of this title if planned MSS has already been authorized under that permit.

The Site has not been previously authorized under §116.111. Burlington has voluntarily included MSS activities in this SP registration submittal as opposed to the delayed compliance date. Therefore, the requirements of this rule will be met.

SP (i)(2)

This rule states that releases of air contaminants during, or as result of, planned MSS must be quantified and meet the emission limits in this standard permit, as applicable. This analysis must include:
(A) alternate operational scenarios or redirection of vent streams;
(B) pigging, purging, and blowdowns;
(C) temporary facilities if used for degassing or purging of tanks, vessels, or other facilities;
(D) degassing or purging of tanks, vessels, or other facilities; and
(E) management of sludge from pits, ponds, sumps, and water conveyances.

This submittal includes emissions representations for alternate operational scenarios during maintenance events. The first scenario occurs when the well is shut in and not producing so that the flare on site may be taken down for maintenance. Emissions related to the standing losses of the liquids already in the storage tanks at the time of shut in are represented in this application as an MSS event. Working losses and flash emissions will not occur as the liquid levels would not be changing.

The second scenario occurs when the engines located at the site goes down for maintenance. This would result in gas released from the compressor and in turn from the engine starter vent. All gas from the blowdown is sent to the flare. The proposed site emissions include this maintenance event and the resulting combustion emissions.

All other MSS activities listed in this rule do not apply to the Site.

SP (i)(3)

This rule states that other planned MSS activities authorized by this standard permit are limited to the following. These planned MSS activities require only recordkeeping of the activity.
(A) Routine engine component maintenance including filter changes, oxygen sensor replacements, compression checks, overhauls, lubricant changes, spark plug changes, and emission control system maintenance.
(B) Boiler refractory replacements and cleanings.
(C) Heater and heat exchanger cleanings.
(D) Turbine hot standard permit swaps.
(E) Pressure relief valve testing, calibration of analytical equipment; instrumentation/analyzer maintenance; replacement of analyzer filters and screens.

Burlington will maintain records for the planned MSS activities listed in this SP registration; therefore, the requirements of this rule are met.

SP (i)(4)

This rule states that engine and compressor startups associated with preventative system shutdown activities have the option to be authorized as part of typical operations if:
(A) prior to operation, alternative operating scenarios to divert gas or liquid streams are registered and certified with all supporting documentation;
(B) engine/compressor shutdowns shall result in no greater than 4 lb/hr of natural gas emissions; and
(C) emissions which result from the subsequent compressor startup activities are controlled to a minimum of 98% efficiency for VOC and H_2S.

Burlington will comply with this section.

SP (j)

This rule states requirements for sampling, monitoring, and records. The following records shall be maintained at the facility site (or an office within Texas having day-to-day operational control of the plant site) in written or electronic form and be readily available to the agency or local air pollution control program with jurisdiction upon request.
(1) Sampling and demonstrations of compliance shall include the requirements listed in Paragraph (m) Table 7.
(2) Monitoring and records for demonstrations of compliance shall include the requirements listed in Paragraph (m) Table 8.

Burlington will perform the sampling and monitoring activities and maintain the appropriate records as required in Paragraph (m) Tables 7 and 8; therefore, the requirements of this rule will be met.

SP (k)(1)-(2)

This rule states all impacts evaluations must be completed on a contaminant-by-contaminant basis for any net emissions increases resulting from a project and must meet the following as appropriate:
(A) Compliance with state or federal ambient air standards for nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and H_2S shall be demonstrated using the shortest distance from any emission point, vent, or fugitive component to the nearest property-line within 1 mile of a project.
(B) Compliance with hourly and annual ESLs for benzene shall be demonstrated using the shortest distance from any emission point, vent, or fugitive component to the nearest receptor within 1 mile of a project.

Impacts analyses were conducted in accordance with this rule. Please refer to attachment 5 for the impacts evaluation.

SP (k)(3)

This rule states that impacts evaluations are not required under the following cases:
(A) If there is no receptor within 1 mile of a registration, no further ESL review is required.
(B) If there is no property line within 1 mile of a registration, no further ambient air quality standard review is required.
(C) If the project total emissions are less than 0.039 lb/hr benzene, 0.025 lb/hr H_2S, 2 lb/hr SO_2, or 4 lb/hr NO_2, no additional analysis or demonstration of the specified air contaminant is required.

The receptor is within 1 mile of the Site. Hourly total emissions for Benzene, NO_x, and H_2S exceed the limits in subsection (C). Therefore, impact evaluations are required for each of these contaminants and are included in Attachment 5. However, the project SO_2 emissions are below the screening values listed in this rule; therefore, no additional analysis or demonstration for this specified air contaminant is necessary.

SP (k)(4)

This rule states that emission evaluations shall meet the following:
(A) For all evaluations of NO_X to NO_2, a conversion factor of 0.20 for 4-stroke rich and lean-burn engines and 0.50 for 2-stroke lean-burn engines may be used.
(B) The maximum predicted concentration or rate at the property boundary or receptor, whichever is appropriate, must not exceed a state or federal ambient air standard or ESL.

Emission evaluations were conducted in accordance with this rule. As shown in Attachment 5, the maximum predicted concentrations at the property boundary or receptor were below the state or federal ambient air standard.

SP (k)(5)(A)

This rule states that the following shall be met for ESL reviews:
(i) If a project's air contaminant maximum predicted concentrations are equal to or less than 10% of the appropriate ESL, no further review is required.
(ii) If a project's air contaminant maximum predicted concentrations combined with project increases for that contaminant over a 60-month period after the effective date of this revised section are equal to or less than 25% of the appropriate ESL, no further review is required.
(iii) In all other cases, all facility emissions at an OGS, regardless of authorization type, located within 1 mile of a project requiring registration under this section shall be evaluated.

Burlington has evaluated all Site emissions for impacts analysis purposes. Refer to Attachment 5 for modeling results.

SP (k)(5)(B)

This rule states that the following shall be met for state and federal ambient air quality standard reviews:
(i) If a project's air contaminant maximum predicted concentrations are equal to or less than the significant impact level (also known as de minimis impact in Chapter 101 of this title (relating to General Air Quality Rules)), no further review is required;
(ii) In all other cases, all facility emissions at an OGS, regardless of authorization type, located within 1 mile of a project requiring registration under this section shall be evaluated.

Please refer to Attachment 5.

SP (k)(6)

This rule states that evaluation must comply with one of the methods listed with no changes or exceptions.
(A) Emission impact Tables 2 - 5F in Paragraph (m) may be used in accordance with the limits and descriptions in Paragraph (m) Table 1.
(B) A screening model may be used to demonstrate acceptable emissions from an OGS under this section if all of the parameters in the screening modeling protocol provided by the commission are met.

(C) A refined dispersion model may be used to demonstrate acceptable emissions from an OGS if all of the parameters in the refined dispersion modeling protocol provided by the commission are met.

Screen modeling was used to satisfy the requirements of this rule for the NOx emissions impacts analysis. The TCEQ provided impact Tables were utilized for Benzene and H_2S. These results are provided in Attachment 5.

SP (l)
This paragraph states that 30 TAC §116.620 is applicable for existing unchanged facilities and new or changing facilities as specified in paragraph (a)(1) of this standard permit.

Burlington has voluntarily elected to comply with paragraphs (a) through (k) of this Non-Rule SP. Therefore, paragraph (l) of this rule is not applicable.

30 TAC §116.610. Applicability, effective February 1, 2006

30 TAC §116.610(a)(1)

This paragraph of the TCEQ standard permit applicability rules requires that any project with a net increase in any air contaminant other than carbon dioxide, water, nitrogen, methane, ethane, hydrogen, oxygen, or those for which a National Ambient Air Quality Standard (NAAQS) has been established must meet the emission limitations of 30 TAC §106.261(2) or (3) or §106.262(2), unless otherwise specified by a particular standard permit.

The Site is electing to comply with the requirements of the Non-Rule Air Quality Standard Permit for Oil and Gas Handling and Production Facilities effective February 27, 2011, which supersedes the emission limitations of this rule. Therefore, this rule does not apply.

30 TAC §116.610(a)(2)

This rule states that a project authorized by standard permit must meet the conditions of the standard permit in effect at the time construction or operation is commenced.

The Site will meet the requirements of the Non-Rule Air Quality SP for Oil and Gas Handling and Production Applicability effective February 27, 2011. Should another SP come into effect prior to TCEQ concurrence with this SP authorization, Burlington will comply with the requirements of that version of the SP.

30 TAC §116.610(a)(3)

This rule requires that the project comply with applicable provisions of the Federal Clean Air Act (FCAA), §111 (concerning New Source Performance Standards (NSPS), as listed under 40 Code of Federal Regulations (CFR) Part 60.

The applicability of this rule is discussed above under section (c)(2)(B) of the Non-Rule SP.

30 TAC §116.610(a)(4)

This rule requires that the proposed project comply with the applicable provisions of the FCAA, §112 concerning Hazardous Air Pollutants (HAPs), as listed under 40 CFR Part 61.

The applicability of this rule is discussed above under section (c)(2)(B) of the Non-Rule SP.

30 TAC §116.610(a)(5)

This rule states that the project must comply with applicable maximum achievable control technology (MACT) standards listed under 40 CFR Part 63 or 30 TAC Chapter 113, Subchapter C relating to National Emissions Standards for Hazardous Air Pollutants.

The applicability of this rule is discussed above under section (c)(2)(B) of the Non-Rule SP.

30 TAC §116.610(a)(6)

This rule applies to facilities that are subject to the Mass Emissions Cap and Trade requirements listed in 30 TAC Chapter 101, Subchapter H, Division 3.

These requirements do not apply to the Site, which is located in Dewitt County, Texas.

30 TAC §116.610(b)

This rule states that any project, except those authorized under 30 TAC §116.617 of this title (relating to Standard Permits for Pollution Control Permits), which constitute a new major source or major modification under the new source review requirements of the FCAA, Part C or Part D is subject to the requirements of 30 TAC §116.110 rather than 30 TAC Chapter 116 Subchapter F.

The Site is not a major source of air pollutants, with respect to Prevention of Significant Deterioration (PSD) permitting regulations. The Site is located in Dewitt County, which is an attainment county; therefore, the Site is not required to be evaluated for nonattainment permitting requirements.

30 TAC §116.610(c)

This rule prohibits circumvention of the requirements of 30 TAC §116.110 by artificial limitations.

Burlington is not taking any artificial limitations on the Site's emissions. Therefore, the condition of this rule has been met.

30 TAC §116.610(d)

This rule states that any project involving a proposed affected facility (as defined in §116.15(1) of this title (relating to Section 112(g) Definitions)) shall comply with all applicable requirements under Subchapter C of this chapter (relating to Hazardous Air Pollutants: Regulations Governing Constructed and Reconstructed Major Sources (FCAA, §112(g), 40 CFR Part 63)).

The Site is not subject to FCAA §112(g), 40 CFR Part 63 requirements, referenced in 30 TAC Chapter 116 Subchapter C.

30 TAC §116.611. Registration to Use a Standard Permit, effective December 11, 2002

This rule states that, if required, registration to use a standard permit shall be sent by certified mail, return receipt requested, or hand delivered to the executive director, the appropriate commission regional office,

and any local air pollution program with jurisdiction, before a standard permit can be issued. The registration, at a minimum, must include the basis of the air emission estimates, quantification of all emission increases and decreases associated with the project, sufficient information to demonstrate the project's compliance with §116.610(b), information describing efforts to minimize emissions increases that will result from the project, a description of the project and related processes, and a description of any equipment installed. A certified registration must be submitted to avoid applicability of Chapter 122 and be maintained in accordance with §116.115.

A certified registration for this Site is being submitted to the appropriate state and local entities using the required forms and including all appropriate demonstrations of compliance with the requirements of this rule.

30 TAC §116.614. Standard Permit Fees, effective October 20, 2002

This rule states that any person who registers to use a standard permit or an amended standard permit, or to renew a registration to use a standard permit shall remit at the time of registration, a flat fee of $900 for each standard permit being registered. All standard permit fees will be remitted in the form of a check, certified check, electronic funds transfer, or money order made payable to the TCEQ and delivered with the permit registration.

A fee of $850.00 for this SP is being remitted to the TCEQ with the SP registration. A fee of $50.00 was submitted with the initial notification on May 6, 2013.

30 TAC §116.615. General Conditions, effective March 15, 2007

30 TAC §116.615(1)

This condition states that emissions from the facility must comply with all applicable rules and regulations adopted under Texas Health and Safety Code, Chapter 382, and with the intent of the Texas Clean Air Act (TCAA), including protection of health and property of the public.

The Site emissions will comply with all TCEQ rules and regulations as well as with the intent of the TCAA, including protection of the health and property of the people near the Site.

30 TAC §116.615(2)

This condition states that all representations with regard to construction plans, operating procedures, and maximum emission rates in any registration package become conditions upon which the facility, or changes thereto, must be constructed and operated.

The Site will be operated as represented in this SP. If any representation changes occur, Burlington will verify that the emission sources remain eligible for a SP and notify the executive director of any changes no later than 30 days after the change, in accordance with this condition.

30 TAC §116.615(3)

This condition states that all changes authorized under standard permit to a facility previously authorized under 30 TAC §116.110 shall be incorporated into that permit at such time as the permit is amended or renewed.

The Site was not previously authorized under 30 TAC §116.110; therefore, this condition does not apply.

30 TAC §116.615(4)

This condition states that start of construction, construction interruptions exceeding 45 days, and completion of construction shall be reported to the appropriate regional office not later than 15 working days after occurrence of the event, unless otherwise specified in the standard permit.

Burlington will comply with the reporting requirements listed in this condition.

30 TAC §116.615(5)

This condition lists requirements associated with start-up notification to the appropriate air program regional office and any other air pollution control program having jurisdiction.

This rule is not applicable for sites subject to the Non-Rule Air Quality SP for Oil and Gas Handling and Production Facilities Applicability sections (a)-(k).

30 TAC §116.615(6)

This condition contains requirements associated with stacks or process vents required to perform sampling operations.

Burlington will continue to conduct sampling required by this SP, as applicable. Should the TCEQ request stack sampling of other sources authorized by this SP, Burlington will comply with this section.

30 TAC §116.615(7)

This condition requires that the standard permit holder demonstrate or otherwise justify the equivalency of emission control methods, sampling or other emission testing methods, and monitoring methods proposed as alternatives to methods indicated in the conditions of the standard permit.

Burlington is not proposing alternative emission control methods, sampling or other emission testing methods, or monitoring methods at this time. Should Burlington elect to propose such alternatives, Burlington will do so in accordance with this condition.

30 TAC §116.615(8)

This condition contains the recordkeeping requirements associated with the standard permit.

Burlington will retain a copy of the SP along with information and data sufficient to demonstrate applicability of, and compliance with, the SP and will be made available at the request of representatives of the executive director, the EPA, or any air pollution control program having jurisdiction.

30 TAC §116.615(9)

This condition requires that facilities covered by the standard permit not be operated unless all air pollution emission capture and abatement equipment is maintained in good working order and operating properly during normal facility operations.

Equipment will not be operated unless the air emissions control equipment is operating properly during normal facility operations. Any emission events that are not included in this SP will be reported in accordance with 30 TAC §101.201 and §101.211.

30 TAC §116.615(10)

This condition states that registration of a standard permit by a standard permit applicant constitutes an acknowledgement and agreement that the holder will comply with all rules, regulations, and orders of the commission issued in conformity with the TCAA and the conditions precedent to the claiming of the standard permit.

Burlington will comply with all applicable rules, regulations, and orders of the commission.

30 TAC §116.615(11)

This condition states that if a standard permit for a facility requires a distance, setback, or buffer from other property or structures as a condition of the permit, the determination of whether the distance, setback, or buffer is satisfied shall be made on the basis of conditions existing at the earlier of:

(A) the date new construction, expansion, or modification of a facility begins; or
(B) the date any application or notice of intent is first filed with the commission to obtain approval for the construction or operation of the facility.

Burlington will comply with the distance determination requirements stated in this rule, as applicable.

Air Quality Standard Permits (SP)
General Requirements Checklist
Title 30 Texas Administrative Code §§116.610-116.615

Check the most appropriate answer and include any additional information in the spaces provided. If additional space is needed, please include an extra page and reference the rule number. The SP forms, tables, checklists, and guidance documents are available from the TCEQ, Air Permits Division web site at: www.tceq.state.tx.us/permitting/air/nav/standard.html.

Most Standard Permits require registration with the commission's Office of Permitting, Remediation, and Registration in Austin. The facilities and/or changes to facilities can be registered by completing a **Form PI-1S**, "Registration for Air Standard Permit." This checklist should accompany the registration form to expedite any registration review.

CHECK THE MOST APPROPRIATE ANSWERS AND FILL IN THE REQUESTED INFORMATION			
Rule	**Questions/Description**	**Information**	**Response**
116.610 (a)(1)	Are there net emissions increases associated with this registration? *If "YES," will net emission increases of air contaminants from the project, other than those for which a National Ambient Air Quality Standard (NAAQS) has been established, meet the emission limits of § 106.261 or § 106.262?* *If "NO," does the specific standard permit exempt emissions from this limit?*	Attach emissions summary & calculations	☑ YES ☐ NO ☐ YES ☑ NO ☑ YES ☐ NO
116.610 (a)(3)	Do any of the Title 40 Code of Federal Regulations Part (CFR) 60, New Source Performance Standards apply to this registration? *If "YES," list subparts*	List subparts: NSPSOOOO	☑ YES ☐ NO
116.610 (a)(4)	Do any Hazardous Air Pollutant requirements apply to this registration? *If "YES," list subparts*	List subparts:	☐ YES ☑ NO
116.610 (a)(5)	Do any maximum achievable control technology (MACT) standards as listed under 40 CFR Part 63 or Chapter 113, Subchapter C (National Emissions Standard for Hazardous Air for Source Categories) apply to this registration? *If "YES," list subparts*	List subparts: MACT ZZZZ, MACT HH	☑ YES ☐ NO
116.610 (a)(6)	Will additional emission allowances under Chapter 101, Subchapter H, Division 3, Emissions Banking and Trading, need to be obtained following this registration?		☐ YES ☑ NO

Air Quality Standard Permits (SP)
General Requirements Checklist
Title 30 Texas Administrative Code §§116.610-116.615

CHECK THE MOST APPROPRIATE ANSWERS AND FILL IN THE REQUESTED INFORMATION			
Rule	**Questions/Description**	**Information**	**Response**
116.611 (a) (1-6)	Is the following documentation included with this registration:		☑YES ☐NO
	Emissions calculations including the basis of the calculations?		☑YES ☐NO
	Quantification of all emission increases and/or decreases associated with this project?		☑YES ☐NO
	Sufficient information demonstrating that this project does not trigger PSD or NNSR review?		☑YES ☐NO
	Description of efforts to minimize collateral emissions increases associated with this project?		☑YES ☐NO
	Process descriptions including related processes?		☑YES ☐NO
	Description of any equipment being installed?		☑YES ☐NO
116.614	Are the required fee and a copy of the check or money order provided with the application?		☑YES ☐NO
116.615 (1)	Will emissions from the facility comply with all applicable rules and regulations of the commission adopted under Texas Health and Safety Code, Chapter 382, and with the intent of the Texas Clean Air Act?		☑YES ☐NO
116.615 (2)	Do you understand that all representations with regard to construction plans, operating procedures, and maximum emission rates in this registration become conditions upon which the facility will be constructed and operated?		☑YES ☐NO
116.615 (3)	Do you understand that all changes authorized by this registration need to be incorporated into the facility's permit if the facility is currently permitted under §116.110 (relating to Applicability)?	*List all related permit numbers:* 103471	☑YES ☐NO
116.615 (9) 617 (e)(1)	Will all air pollution emission capture and abatement equipment be maintained in good working order?		☑YES ☐NO
116.615 (10)	Will the facility comply with all applicable rules and regulations of the TCEQ, the Texas Health and Safety Code, Chapter 382, and the Texas Clean Air Act?		☑YES ☐NO

ATTACHMENT 5
IMPACTS EVALUATION

OIL AND GAS STANDARD PERMIT REGISTRATION

DEWITT CENTRAL FACILITY 3

BURLINGTON RESOURCES OIL & GAS COMPANY LP

SUMMARY OF NO_X SCREEN3 MODELING RESULTS

OIL & GAS STANDARD PERMIT REGISTRATION

DEWITT CENTRAL FACILITY 3

BURLINGTON RESOURCES OIL & GAS COMPANY LP

FIN	EPN	Description	$PTE_{(NOx,HR)}$[a] (lb/hr)	$C_{(NOx,HR)}$[b] ($\mu g/m^3$)	$GLC_{(NOx,HR)}$[c] ($\mu g/m^3$)	$R_{(NO_2/NO_X)}$[d] (lb NO_2/lb NO_X)	$GLC_{(NO_2,HR)}$[e] ($\mu g/m^3$)	Annual Conversion Factor (CF)	$GLC_{(NOx,YR)}$[f] ($\mu g/m^3$)
Normal Operations									
COMP-01	COMP-01	Compressor Engine 1	5.91	7.78	45.98	0.20	9.20	0.08	0.74
REB-1	REB-1	Glycol Reboiler No. 1	0.05	467.80	23.39	0.75	17.54	0.08	1.40
FL-1	FL-1	Flare Combustion (normal operations pilot)	0.003	152.30	0.46	0.75	0.35	0.08	0.03
FL-1	FL-1	Flare Combustion (normal operations assist gas)	0.22	12.48	2.75	0.75	2.06	0.08	0.16
FL-1	FL-1	Flare Combustion (normal operations waste gas condensate)	0.78	4.47	3.49	0.75	2.62	0.08	0.21
FL-1	FL-1	Flare Combustion (normal operations waste gas produced water)	0.01	93.73	0.94	0.75	0.71	0.08	0.06
FL-1	FL-1	Flare Combustion (normal operations waste gas dehy)	0.37	8.25	3.05	0.75	2.29	0.08	0.18
Maintenance, Startup, and Shutdown									
FL-1-SMSS	FL-1-SMSS	Flare Combustion (engines blowdown waste gas)	0.21	13.13	2.76	0.75	2.07	0.08	0.17
					Total NO_2 Concentration ($\mu g/m^3$):		**36.84**		**2.95**
					DeWitt County NO_2 Background Concentration ($\mu g/m^3$)[g]:		**70.00**		**20.00**
					Total Off-Property Concentration ($\mu g/m^3$):		**106.84**		**22.95**
					NO_2 NAAQS ($\mu g/m^3$):		**188**		**100**

[a] $PTE_{(NO_X,HR)}$ = Hourly PTE NO_X.

[b] $C_{(NO_X,HR)}$ = Hourly NO_X concentration predicted by SCREEN3 model, using a nominal 1 lb/hr NO_X emission rate.

[c] $GLC_{(NO_X,HR)}$ = Hourly ground level concentration of NO_X.

An example calculation for hourly NO_X ground level concentration for FIN FL-1 (normal operations pilot) follows:

$GLC_{(NO_X,HR)} = PTE_{(NO_X,HR)} * C_{(NO_X,HR)}$

$GLC_{(NOX,HR)}$ = (0.003 lb/hr) * (152.30 µg/m3/1 lb/hr)

$GLC_{(NOX,HR)}$ = 0.46 µg/m3 NOX

[d] $R_{(NO_2/NO_X)}$ = NO_2/NO_X ratio from TCEQ guidance and section (k) of the Non-Rule Standard Permit (attached).

[e] $GLC_{(NO_2,HR)}$ = Hourly ground level concentration of NO_2.

An example calculation for hourly NO_2 ground level concentration for FIN FL-1 follows:

$GLC_{(NO_2,HR)} = GLC_{(NOx,HR)} * R_{(NO_2/NO_X)}$

$GLC_{(NO2,HR)}$ = (0.46 µg/m3) * (0.75 lb NO2/lb NOX)

$GLC_{(NO2,HR)}$ = 0.35 µg/m3 NO2

[f] $GLC_{(NO_2,YR)}$ = Annual ground level concentration of NO_2.

An example calculation for annual NO_2 ground level concentration for FIN FL-1 follows:

$GLC_{(NO_2,YR)} = GLC_{(NO_2,HR)} * CF$

$GLC_{(NO2,YR)}$ = (0.35 µg/m3) * (0.08)

$GLC_{(NO2,YR)}$ = 0.03 µg/m3 NO2

[g] The hourly and annual NO_2 background concentration is based on TCEQ Guidance.

Maximum concentrations are shown for each stream sent to the Flare. Note that, the maximum distance is not the same for each stream, but representing all at the maximum concentration is the most conservative approach. Additionally, not all events shown here would occur at the same time (MSS events would not occur during normal operations events), therefore the emissions shown are conservatively represented.

BENZENE EMISSION IMPACT ANALYSIS
OIL AND GAS STANDARD PERMIT REGISTRATION
DEWITT CENTRAL FACILITY 3
BURLINGTON RESOURCES OIL & GAS COMPANY LP

Hourly ESL (µg/m3): **170**
Annual ESL (µg/m3): **4.5**

		Benzene Emissions		Stack Parameters: Distance	Stack Parameters: Height	G	WR		Calculated Health Effects Review	
EPN	FIN	(lb/hr)	(tpy)	(ft)	(ft)	(µg/m³/lb/hr)	(hourly)	(annual)	(lb/hr)	(tpy)
Normal Operations										
COMP-01	COMP-01	0.01	0.04	1500	20	8	3.70%	11.76%	0.79	3.62
FUG	FUG	0.01	0.04	1500	3	149	3.70%	11.76%	0.04	0.19
REB-1	REB-1	0.000001	0.000004	1500	14.3	84	0.0004%	0.001%	0.00001	0.00003
REB-1	DEHY-SV	0.05	0.21	1500	14.3	84	18.52%	61.76%	0.37	1.81
FL-1	TK-01 TK-02	0.01	0.03	1500	30	34	3.70%	8.82%	0.19	0.64
FL-1	TK-03	0.002	0.0004	1500	30	34	0.74%	0.12%	0.04	0.009
FL-1	TK-04	0.0002	0.001	1500	30	34	0.07%	0.29%	0.004	0.02
FL-1	TRUCK1	0.02	0.01	1500	30	34	7.41%	2.94%	0.37	0.21
FL-1	TRUCK2	0.0001	0.00002	1500	30	34	0.04%	0.006%	0.002	0.0004
FL-1	FL-1	0.000003	0.00001	1500	30	34	0.001%	0.003%	0.0001	0.0002
Maintenance, Startup, and Shutdown										
COMP-01-SV	COMP-01-SV	0.16	0.004	1500	20	15	59.26%	1.18%	6.72	0.19
FL-1-SMSS	COMP-01-BD	0.004	0.0001	1500	20	34	1.48%	0.03%	0.07	0.002
TK-01 TK-02	TK-01 TK-02	0.00	0.00	1500	25	149	0.00%	0.00%	0.00	0.00
TK-03	TK-03	0.00	0.00	1500	25	149	0.00%	0.00%	0.00	0.00
TK-04	TK-04	0.00001	0.000001	1500	25	149	0.004%	0.0003%	0.00005	0.000005
	Total	**0.27**	**0.34**						**8.60**	**6.69**

Impacts Analysis:

	Hourly	Annual
Calculated Benzene Emissions (lb/hr):	**0.27**	**0.34**
Calculated Benzene Health Effects Review (lb/hr):	**8.60**	**6.69**

Per the non-Rule Oil and Gas Standard Permit (k)(4)(B), the site's air contaminant maximum predicted concentrations are less than the appropriate ESL. Therefore the impacts analysis meets the requirements of the Oil and Gas Standard Permit.

Health Effects Calculations and Impact factors G and WR, and equations from Air Quality Standard Permit for Oil and Gas Handling and Production Facilities (k) and Tables

Table 1: Emission Impact Tables Limits and Descriptions
Table 2: Fugitives and Process Vents Table
Table 3: Flares and Thermal Destruction Devices
Short-Term ESL 170 µg/m³ and Long-Term ESL 4.5 µg/m³ per TCEQ Development Support Document Benzene CAS #: 71-43-2, dated October 15, 2007

NOTE: Not all events shown here would occur at the same time (MSS events would not occur during normal operations events), therefore the analysis shown is conservatively represented.

H_2S EMISSION IMPACT ANALYSIS
OIL AND GAS STANDARD PERMIT REGISTRATION
DEWITT CENTRAL FACILITY 3
BURLINGTON RESOURCES OIL & GAS COMPANY LP

State Property Line Standard (µg/m3): 108

EPN	FIN	Description	H_2S Emissions (lb/hr)	Stack Parameters Distance (ft)	Stack Parameters Height (ft)	G (µg/m³/lb/hr)	WR (hourly)	Calculated Health Effects Review (lb/hr)
Normal Operations								
FUG	FUG	Site Fugitives	0.001	50	3	4375	1.25%	0.0003
REB-1	DEHY-SV	Glycol Dehy Still Vent	0.01	50	3	4375	12.50%	0.003
FL-1	TK-01 TK-02	Controlled Condensate Tank Emissions	0.001	50	30	43	1.25%	0.03
FL-1	TK-04	Controlled PW Tank Emissions	0.00004	50	30	43	0.05%	0.001
FL-1	FL-1	Flare Combustion (normal operations waste gas, assist, and pilot)	0.001	50	30	43	1.25%	0.03
Maintenance, Startup, and Shutdown								
COMP-01-SV	COMP-01-SV	Compressor Engine 1 Starter Vent	0.06	50	20	34	75.00%	2.38
FL-1-SMSS	COMP-01-BD	Compressor Engine 1 Blowdown	0.001	50	30	43	1.25%	0.03
FL-1-SMSS	FL-1-SMSS	Flare Combustion (engine blowdown waste gas)	0.001	50	30	43	1.25%	0.03
	Total		**0.08**					**2.50**

Impacts Analysis:

	Hourly
Calculated H_2S Emissions (lb/hr):	**0.08**
Calculated H_2S Health Effects Review (lb/hr):	**2.50**

Per the non-Rule Oil and Gas Standard Permit (k)(4)(B), the site's air contaminant maximum predicted concentrations are less than the appropriate ESL. Therefore the impacts analysis meets the requirements of the Oil and Gas Standard Permit.

Health Effects Calculations and Impact factors G and WR, and equations from Air Quality Standard Permit for Oil and Gas Handling and Production Facilities (k) and Tables
Table 1: Emission Impact Tables Limits and Descriptions
Table 2: Fugitives and Process Vents Table
Table 3: Flares and Thermal Destruction Devices
State Property Line Standard 108 µg/m³ per 30 TAC Ch 112 and TCEQ Modeling Guidance

NOTE: Not all events shown here would occur at the same time (MSS events would not occur during normal operations events), therefore the analysis shown is conservatively represented.

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 13043 ***

DeWitt Central Facility 3 -COMP-01

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	0.125800
STACK HEIGHT (M)	=	6.0960
STK INSIDE DIAM (M)	=	0.3048
STK EXIT VELOCITY (M/S)	=	49.5647
STK GAS EXIT TEMP (K)	=	740.0000
AMBIENT AIR TEMP (K)	=	293.0000
RECEPTOR HEIGHT (M)	=	0.0000
URBAN/RURAL OPTION	=	RURAL
BUILDING HEIGHT (M)	=	0.0000
MIN HORIZ BLDG DIM (M)	=	0.0000
MAX HORIZ BLDG DIM (M)	=	0.0000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

STACK EXIT VELOCITY WAS CALCULATED FROM
VOLUME FLOW RATE = 7663.0000 (ACFM)

BUOY. FLUX = 6.819 M**4/S**3; MOM. FLUX = 22.592 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
1.	0.000	1	1.0	1.0	320.0	96.50	2.37	2.34	NO
100.	5.916	3	10.0	10.0	3200.0	15.14	12.60	7.67	NO
200.	7.399	4	15.0	15.0	4800.0	12.12	15.66	8.67	NO
300.	6.727	4	10.0	10.0	3200.0	15.14	22.76	12.37	NO
400.	5.815	4	8.0	8.0	2560.0	17.40	29.63	15.61	NO
500.	5.139	4	5.0	5.0	1600.0	24.18	36.51	19.01	NO
600.	4.619	4	4.5	4.5	1440.0	26.19	43.10	21.97	NO
700.	4.170	4	4.0	4.0	1280.0	28.70	49.61	24.89	NO
800.	3.795	4	3.5	3.5	1120.0	31.93	56.06	27.78	NO
900.	3.479	4	3.5	3.5	1120.0	31.93	62.32	30.38	NO
1000.	3.228	4	3.0	3.0	960.0	36.23	68.67	33.23	NO
1100.	2.984	4	3.0	3.0	960.0	36.23	74.81	35.19	NO
1200.	2.792	4	2.5	2.5	800.0	42.26	81.10	37.54	NO
1300.	2.625	4	2.5	2.5	800.0	42.26	87.13	39.38	NO
1400.	2.467	4	2.5	2.5	800.0	42.26	93.13	41.18	NO
1500.	2.521	5	1.0	1.0	10000.0	62.46	75.44	32.24	NO
1600.	2.586	5	1.0	1.0	10000.0	62.46	79.79	33.25	NO
1700.	2.635	5	1.0	1.0	10000.0	62.46	84.13	34.25	NO
1800.	2.669	5	1.0	1.0	10000.0	62.46	88.45	35.23	NO
1900.	2.692	5	1.0	1.0	10000.0	62.46	92.76	36.20	NO
2000.	2.786	6	1.0	1.0	10000.0	52.87	65.06	25.42	NO
2100.	2.843	6	1.0	1.0	10000.0	52.87	67.88	25.92	NO
2200.	2.892	6	1.0	1.0	10000.0	52.87	70.70	26.41	NO

SCREEN

2300.	2.934	6	1.0	1.0	10000.0	52.87	73.50	26.89	NO
2400.	2.969	6	1.0	1.0	10000.0	52.87	76.30	27.37	NO
2500.	2.998	6	1.0	1.0	10000.0	52.87	79.08	27.84	NO
2600.	3.020	6	1.0	1.0	10000.0	52.87	81.86	28.31	NO
2700.	3.038	6	1.0	1.0	10000.0	52.87	84.63	28.76	NO
2800.	3.051	6	1.0	1.0	10000.0	52.87	87.39	29.22	NO
2900.	3.059	6	1.0	1.0	10000.0	52.87	90.15	29.66	NO
3000.	3.064	6	1.0	1.0	10000.0	52.87	92.89	30.10	NO
3500.	2.988	6	1.0	1.0	10000.0	52.87	106.49	31.91	NO
4000.	2.883	6	1.0	1.0	10000.0	52.87	119.92	33.61	NO
4500.	2.766	6	1.0	1.0	10000.0	52.87	133.17	35.21	NO
5000.	2.645	6	1.0	1.0	10000.0	52.87	146.28	36.72	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:

144.	7.780	3	10.0	10.0	3200.0	15.14	17.73	10.72	NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	7.780	144.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 13043 ***

DeWitt Central facility 3 - REB-1

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	0.125800
STACK HEIGHT (M)	=	4.3586
STK INSIDE DIAM (M)	=	0.3175
STK EXIT VELOCITY (M/S)	=	0.4117
STK GAS EXIT TEMP (K)	=	672.0000
AMBIENT AIR TEMP (K)	=	293.0000
RECEPTOR HEIGHT (M)	=	0.0000
URBAN/RURAL OPTION	=	RURAL
BUILDING HEIGHT (M)	=	0.0000
MIN HORIZ BLDG DIM (M)	=	0.0000
MAX HORIZ BLDG DIM (M)	=	0.0000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

STACK EXIT VELOCITY WAS CALCULATED FROM
VOLUME FLOW RATE = 69.059998 (ACFM)

BUOY. FLUX = 0.057 M**4/S**3; MOM. FLUX = 0.002 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
1.	0.000	1	1.0	1.0	320.0	6.18	0.45	0.25	NO
100.	436.5	4	1.0	1.0	320.0	6.18	8.23	4.71	NO
200.	231.8	4	1.0	1.0	320.0	6.18	15.58	8.53	NO
300.	128.3	4	1.0	1.0	320.0	6.18	22.62	12.11	NO
400.	81.94	4	1.0	1.0	320.0	6.18	29.46	15.29	NO
500.	81.85	6	1.0	1.0	10000.0	13.18	18.17	8.82	NO
600.	78.81	6	1.0	1.0	10000.0	13.18	21.41	10.06	NO
700.	72.85	6	1.0	1.0	10000.0	13.18	24.61	11.26	NO
800.	66.01	6	1.0	1.0	10000.0	13.18	27.77	12.28	NO
900.	59.64	6	1.0	1.0	10000.0	13.18	30.90	13.26	NO
1000.	53.91	6	1.0	1.0	10000.0	13.18	33.99	14.22	NO
1100.	48.91	6	1.0	1.0	10000.0	13.18	37.06	15.07	NO
1200.	44.54	6	1.0	1.0	10000.0	13.18	40.11	15.89	NO
1300.	40.72	6	1.0	1.0	10000.0	13.18	43.13	16.69	NO
1400.	37.38	6	1.0	1.0	10000.0	13.18	46.13	17.47	NO
1500.	34.44	6	1.0	1.0	10000.0	13.18	49.11	18.23	NO
1600.	31.84	6	1.0	1.0	10000.0	13.18	52.07	18.98	NO
1700.	29.54	6	1.0	1.0	10000.0	13.18	55.01	19.70	NO
1800.	27.49	6	1.0	1.0	10000.0	13.18	57.93	20.42	NO
1900.	25.65	6	1.0	1.0	10000.0	13.18	60.84	21.11	NO
2000.	24.01	6	1.0	1.0	10000.0	13.18	63.73	21.80	NO
2100.	22.59	6	1.0	1.0	10000.0	13.18	66.61	22.38	NO
2200.	21.30	6	1.0	1.0	10000.0	13.18	69.48	22.94	NO

2300.	20.13	6	1.0	1.0	10000.0	13.18	72.33	23.50	NO
2400.	19.07	6	1.0	1.0	10000.0	13.18	75.17	24.04	NO
2500.	18.09	6	1.0	1.0	10000.0	13.18	78.00	24.58	NO
2600.	17.20	6	1.0	1.0	10000.0	13.18	80.81	25.10	NO
2700.	16.38	6	1.0	1.0	10000.0	13.18	83.61	25.62	NO
2800.	15.62	6	1.0	1.0	10000.0	13.18	86.41	26.12	NO
2900.	14.92	6	1.0	1.0	10000.0	13.18	89.19	26.62	NO
3000.	14.27	6	1.0	1.0	10000.0	13.18	91.96	27.11	NO
3500.	11.75	6	1.0	1.0	10000.0	13.18	105.69	29.11	NO
4000.	9.912	6	1.0	1.0	10000.0	13.18	119.20	30.96	NO
4500.	8.522	6	1.0	1.0	10000.0	13.18	132.53	32.69	NO
5000.	7.440	6	1.0	1.0	10000.0	13.18	145.70	34.32	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:

55.	467.8	3	1.0	1.0	320.0	6.18	7.32	4.44	NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	467.8	55.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

DeWitt Central facility 3 - Flare Pilot

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	FLARE
EMISSION RATE (G/S)	=	.125800
FLARE STACK HEIGHT (M)	=	9.1440
TOT HEAT RLS (CAL/S)	=	1356.00
RECEPTOR HEIGHT (M)	=	.0000
URBAN/RURAL OPTION	=	RURAL
EFF RELEASE HEIGHT (M)	=	9.2873
BUILDING HEIGHT (M)	=	.0000
MIN HORIZ BLDG DIM (M)	=	.0000
MAX HORIZ BLDG DIM (M)	=	.0000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = .022 M**4/S**3; MOM. FLUX = .014 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
1.	.0000	1	1.0	1.0	320.0	10.75	.45	.26	NO
100.	152.2	3	1.0	1.0	320.0	10.75	12.47	7.45	NO
200.	136.1	4	1.0	1.0	320.0	10.75	15.57	8.51	NO
300.	98.61	4	1.0	1.0	320.0	10.75	22.61	12.10	NO
400.	69.47	4	1.0	1.0	320.0	10.75	29.46	15.27	NO
500.	50.93	4	1.0	1.0	320.0	10.75	36.15	18.30	NO
600.	49.21	6	1.0	1.0	10000.0	16.25	21.33	9.89	NO
700.	50.41	6	1.0	1.0	10000.0	16.25	24.54	11.11	NO
800.	48.61	6	1.0	1.0	10000.0	16.25	27.71	12.14	NO
900.	45.99	6	1.0	1.0	10000.0	16.25	30.84	13.13	NO
1000.	43.07	6	1.0	1.0	10000.0	16.25	33.94	14.09	NO
1100.	40.09	6	1.0	1.0	10000.0	16.25	37.02	14.95	NO
1200.	37.28	6	1.0	1.0	10000.0	16.25	40.06	15.78	NO
1300.	34.68	6	1.0	1.0	10000.0	16.25	43.09	16.59	NO
1400.	32.29	6	1.0	1.0	10000.0	16.25	46.09	17.37	NO
1500.	30.12	6	1.0	1.0	10000.0	16.25	49.07	18.14	NO
1600.	28.14	6	1.0	1.0	10000.0	16.25	52.03	18.89	NO
1700.	26.35	6	1.0	1.0	10000.0	16.25	54.98	19.62	NO
1800.	24.72	6	1.0	1.0	10000.0	16.25	57.90	20.33	NO
1900.	23.23	6	1.0	1.0	10000.0	16.25	60.81	21.03	NO
2000.	21.88	6	1.0	1.0	10000.0	16.25	63.71	21.72	NO
2100.	20.68	6	1.0	1.0	10000.0	16.25	66.59	22.30	NO
2200.	19.59	6	1.0	1.0	10000.0	16.25	69.45	22.87	NO
2300.	18.59	6	1.0	1.0	10000.0	16.25	72.31	23.42	NO
2400.	17.67	6	1.0	1.0	10000.0	16.25	75.15	23.97	NO
2500.	16.82	6	1.0	1.0	10000.0	16.25	77.97	24.51	NO

2600.	16.04	6	1.0	1.0	10000.0	16.25	80.79	25.03	NO
2700.	15.32	6	1.0	1.0	10000.0	16.25	83.59	25.55	NO
2800.	14.65	6	1.0	1.0	10000.0	16.25	86.39	26.06	NO
2900.	14.02	6	1.0	1.0	10000.0	16.25	89.17	26.56	NO
3000.	13.44	6	1.0	1.0	10000.0	16.25	91.94	27.05	NO
3500.	11.16	6	1.0	1.0	10000.0	16.25	105.67	29.05	NO
4000.	9.469	6	1.0	1.0	10000.0	16.25	119.19	30.90	NO
4500.	8.180	6	1.0	1.0	10000.0	16.25	132.52	32.63	NO
5000.	7.169	6	1.0	1.0	10000.0	16.25	145.68	34.26	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:

102.	152.3	3	1.0	1.0	320.0	10.75	12.81	7.66	NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	152.3	102.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

DeWitt Central facility 3 - Flare Assist

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	FLARE
EMISSION RATE (G/S)	=	.125800
FLARE STACK HEIGHT (M)	=	9.1440
TOT HEAT RLS (CAL/S)	=	113048.
RECEPTOR HEIGHT (M)	=	.0000
URBAN/RURAL OPTION	=	RURAL
EFF RELEASE HEIGHT (M)	=	10.3309
BUILDING HEIGHT (M)	=	.0000
MIN HORIZ BLDG DIM (M)	=	.0000
MAX HORIZ BLDG DIM (M)	=	.0000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = 1.874 M**4/S**3; MOM. FLUX = 1.143 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
1.	.0000	1	1.0	1.0	320.0	44.57	.91	.83	NO
100.	10.86	1	3.0	3.0	960.0	21.75	27.05	14.32	NO
200.	12.48	3	3.5	3.5	1120.0	20.11	23.78	14.30	NO
300.	11.65	3	2.0	2.0	640.0	27.44	34.64	20.91	NO
400.	10.91	4	3.0	3.0	960.0	21.72	29.63	15.61	NO
500.	10.30	4	2.5	2.5	800.0	23.99	36.36	18.71	NO
600.	9.635	4	2.0	2.0	640.0	27.41	43.00	21.77	NO
700.	8.887	4	1.5	1.5	480.0	33.10	49.62	24.90	NO
800.	8.375	4	1.5	1.5	480.0	33.10	55.95	27.56	NO
900.	7.752	4	1.5	1.5	480.0	33.10	62.22	30.18	NO
1000.	7.164	4	1.0	1.0	320.0	44.48	68.82	33.54	NO
1100.	6.830	4	1.0	1.0	320.0	44.48	74.95	35.49	NO
1200.	6.481	4	1.0	1.0	320.0	44.48	81.03	37.39	NO
1300.	6.134	4	1.0	1.0	320.0	44.48	87.07	39.23	NO
1400.	5.798	4	1.0	1.0	320.0	44.48	93.06	41.04	NO
1500.	5.478	4	1.0	1.0	320.0	44.48	99.02	42.80	NO
1600.	5.267	6	1.0	1.0	10000.0	40.56	52.71	20.67	NO
1700.	5.445	6	1.0	1.0	10000.0	40.56	55.61	21.34	NO
1800.	5.585	6	1.0	1.0	10000.0	40.56	58.51	22.00	NO
1900.	5.691	6	1.0	1.0	10000.0	40.56	61.39	22.65	NO
2000.	5.767	6	1.0	1.0	10000.0	40.56	64.26	23.29	NO
2100.	5.778	6	1.0	1.0	10000.0	40.56	67.11	23.83	NO
2200.	5.772	6	1.0	1.0	10000.0	40.56	69.96	24.36	NO
2300.	5.753	6	1.0	1.0	10000.0	40.56	72.79	24.89	NO
2400.	5.723	6	1.0	1.0	10000.0	40.56	75.61	25.40	NO
2500.	5.683	6	1.0	1.0	10000.0	40.56	78.42	25.91	NO

2600.	5.636	6	1.0	1.0	10000.0	40.56	81.23	26.40	NO
2700.	5.583	6	1.0	1.0	10000.0	40.56	84.02	26.90	NO
2800.	5.524	6	1.0	1.0	10000.0	40.56	86.80	27.38	NO
2900.	5.461	6	1.0	1.0	10000.0	40.56	89.57	27.86	NO
3000.	5.395	6	1.0	1.0	10000.0	40.56	92.33	28.33	NO
3500.	4.991	6	1.0	1.0	10000.0	40.56	106.00	30.24	NO
4000.	4.609	6	1.0	1.0	10000.0	40.56	119.48	32.02	NO
4500.	4.260	6	1.0	1.0	10000.0	40.56	132.78	33.70	NO
5000.	3.945	6	1.0	1.0	10000.0	40.56	145.93	35.28	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:

200.	12.48	3	3.5	3.5	1120.0	20.11	23.78	14.30	NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	12.48	200.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 13043 ***

DEWITT CENTRAL FACILITY 3 - FLARE COND

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	FLARE
EMISSION RATE (G/S)	=	0.125800
FLARE STACK HEIGHT (M)	=	9.1440
TOT HEAT RLS (CAL/S)	=	394100.
RECEPTOR HEIGHT (M)	=	0.0000
URBAN/RURAL OPTION	=	RURAL
EFF RELEASE HEIGHT (M)	=	11.3001
BUILDING HEIGHT (M)	=	0.0000
MIN HORIZ BLDG DIM (M)	=	0.0000
MAX HORIZ BLDG DIM (M)	=	0.0000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = 6.534 M**4/S**3; MOM. FLUX = 3.984 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
1.	0.000	1	1.0	1.0	320.0	98.12	1.30	1.24	NO
100.	1.381	3	10.0	10.1	3200.0	19.95	12.59	7.66	NO
200.	4.419	3	8.0	8.1	2560.0	22.11	23.82	14.36	NO
300.	4.287	3	5.0	5.1	1600.0	28.60	34.65	20.92	NO
400.	3.913	4	8.0	8.1	2560.0	22.05	29.61	15.57	NO
500.	3.671	4	5.0	5.1	1600.0	28.49	36.48	18.94	NO
600.	3.567	4	5.0	5.1	1600.0	28.49	43.00	21.77	NO
700.	3.347	4	4.5	4.6	1440.0	30.41	49.49	24.65	NO
800.	3.139	4	4.0	4.1	1280.0	32.79	55.91	27.48	NO
900.	2.954	4	3.5	3.6	1120.0	35.86	62.28	30.29	NO
1000.	2.785	4	3.0	3.1	960.0	39.96	68.62	33.12	NO
1100.	2.612	4	3.0	3.1	960.0	39.96	74.76	35.09	NO
1200.	2.461	4	2.5	2.5	800.0	45.69	81.04	37.41	NO
1300.	2.337	4	2.5	2.5	800.0	45.69	87.07	39.25	NO
1400.	2.216	4	2.5	2.5	800.0	45.69	93.07	41.05	NO
1500.	2.099	4	2.5	2.5	800.0	45.69	99.03	42.81	NO
1600.	2.008	4	2.0	2.0	640.0	54.29	105.21	45.14	NO
1700.	2.037	5	1.0	1.0	10000.0	66.08	84.04	34.04	NO
1800.	2.091	5	1.0	1.0	10000.0	66.08	88.37	35.03	NO
1900.	2.134	5	1.0	1.0	10000.0	66.08	92.68	36.00	NO
2000.	2.166	5	1.0	1.0	10000.0	66.08	96.97	36.97	NO
2100.	2.178	5	1.0	1.0	10000.0	66.08	101.24	37.83	NO
2200.	2.184	5	1.0	1.0	10000.0	66.08	105.50	38.67	NO
2300.	2.185	5	1.0	1.0	10000.0	66.08	109.74	39.51	NO
2400.	2.180	5	1.0	1.0	10000.0	66.08	113.97	40.33	NO
2500.	2.172	5	1.0	1.0	10000.0	66.08	118.18	41.14	NO
2600.	2.171	6	1.0	1.1	10000.0	56.39	81.79	28.08	NO

2700.	2.204	6	1.0	1.1	10000.0	56.39	84.56	28.54	NO
2800.	2.232	6	1.0	1.1	10000.0	56.39	87.32	29.00	NO
2900.	2.257	6	1.0	1.1	10000.0	56.39	90.08	29.45	NO
3000.	2.278	6	1.0	1.1	10000.0	56.39	92.82	29.89	NO
3500.	2.283	6	1.0	1.1	10000.0	56.39	106.43	31.71	NO
4000.	2.251	6	1.0	1.1	10000.0	56.39	119.86	33.42	NO
4500.	2.197	6	1.0	1.1	10000.0	56.39	133.13	35.03	NO
5000.	2.131	6	1.0	1.1	10000.0	56.39	146.24	36.55	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:

218.	4.474	3	8.0	8.1	2560.0	22.11	25.86	15.55	NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	4.474	218.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

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 ***  SCREEN3 MODEL RUN  ***
 *** VERSION DATED 13043 ***

DEWITT CENTRAL FACILITY 3 - FLARE PW

SIMPLE TERRAIN INPUTS:
   SOURCE TYPE            =        FLARE
   EMISSION RATE (G/S)    =     0.125800
   FLARE STACK HEIGHT (M) =       9.1440
   TOT HEAT RLS (CAL/S)   =      7000.00
   RECEPTOR HEIGHT (M)    =       0.0000
   URBAN/RURAL OPTION     =        RURAL
   EFF RELEASE HEIGHT (M) =       9.4580
   BUILDING HEIGHT (M)    =       0.0000
   MIN HORIZ BLDG DIM (M) =       0.0000
   MAX HORIZ BLDG DIM (M) =       0.0000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.


BUOY. FLUX =    0.116 M**4/S**3;  MOM. FLUX =    0.071 M**4/S**2.

*** FULL METEOROLOGY ***

**********************************
*** SCREEN AUTOMATED DISTANCES ***
**********************************

*** TERRAIN HEIGHT OF    0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***
```

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
1.	0.000	1	1.0	1.0	320.0	13.72	0.53	0.37	NO
100.	85.09	2	1.0	1.0	320.0	13.72	19.30	10.67	NO
200.	83.36	4	1.0	1.0	320.0	13.72	15.61	8.59	NO
300.	76.95	4	1.0	1.0	320.0	13.72	22.64	12.15	NO
400.	59.38	4	1.0	1.0	320.0	13.72	29.48	15.32	NO
500.	45.64	4	1.0	1.0	320.0	13.72	36.17	18.34	NO
600.	35.80	4	1.0	1.0	320.0	13.72	42.73	21.25	NO
700.	28.75	4	1.0	1.0	320.0	13.72	49.20	24.07	NO
800.	26.08	6	1.0	1.0	10000.0	21.49	27.85	12.46	NO
900.	26.77	6	1.0	1.0	10000.0	21.49	30.97	13.43	NO
1000.	26.75	6	1.0	1.0	10000.0	21.49	34.06	14.37	NO
1100.	26.15	6	1.0	1.0	10000.0	21.49	37.12	15.21	NO
1200.	25.33	6	1.0	1.0	10000.0	21.49	40.16	16.03	NO
1300.	24.38	6	1.0	1.0	10000.0	21.49	43.18	16.83	NO
1400.	23.38	6	1.0	1.0	10000.0	21.49	46.17	17.60	NO
1500.	22.37	6	1.0	1.0	10000.0	21.49	49.15	18.36	NO
1600.	21.36	6	1.0	1.0	10000.0	21.49	52.11	19.09	NO
1700.	20.39	6	1.0	1.0	10000.0	21.49	55.05	19.82	NO
1800.	19.45	6	1.0	1.0	10000.0	21.49	57.97	20.52	NO
1900.	18.56	6	1.0	1.0	10000.0	21.49	60.88	21.22	NO
2000.	17.72	6	1.0	1.0	10000.0	21.49	63.77	21.90	NO
2100.	16.93	6	1.0	1.0	10000.0	21.49	66.65	22.47	NO
2200.	16.19	6	1.0	1.0	10000.0	21.49	69.51	23.04	NO
2300.	15.49	6	1.0	1.0	10000.0	21.49	72.36	23.59	NO
2400.	14.84	6	1.0	1.0	10000.0	21.49	75.20	24.13	NO
2500.	14.24	6	1.0	1.0	10000.0	21.49	78.02	24.67	NO
2600.	13.67	6	1.0	1.0	10000.0	21.49	80.84	25.19	NO

2700.	13.13	6	1.0	1.0	10000.0	21.49	83.64	25.70	NO
2800.	12.63	6	1.0	1.0	10000.0	21.49	86.43	26.21	NO
2900.	12.16	6	1.0	1.0	10000.0	21.49	89.22	26.70	NO
3000.	11.71	6	1.0	1.0	10000.0	21.49	91.99	27.19	NO
3500.	9.898	6	1.0	1.0	10000.0	21.49	105.71	29.18	NO
4000.	8.517	6	1.0	1.0	10000.0	21.49	119.22	31.03	NO
4500.	7.438	6	1.0	1.0	10000.0	21.49	132.55	32.75	NO
5000.	6.575	6	1.0	1.0	10000.0	21.49	145.71	34.38	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:

132.	93.73	3	1.0	1.0	320.0	13.72	16.26	9.74	NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	93.73	132.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 13043 ***

DEWITT CENTRAL FACILITY 3 - FLARE DEHY

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	FLARE
EMISSION RATE (G/S)	=	0.125800
FLARE STACK HEIGHT (M)	=	9.1440
TOT HEAT RLS (CAL/S)	=	188300.
RECEPTOR HEIGHT (M)	=	0.0000
URBAN/RURAL OPTION	=	RURAL
EFF RELEASE HEIGHT (M)	=	10.6588
BUILDING HEIGHT (M)	=	0.0000
MIN HORIZ BLDG DIM (M)	=	0.0000
MAX HORIZ BLDG DIM (M)	=	0.0000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = 3.122 M**4/S**3; MOM. FLUX = 1.904 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
1.	0.000	1	1.0	1.0	320.0	60.76	1.05	0.98	NO
100.	6.335	2	5.0	5.0	1600.0	20.68	19.48	10.98	NO
200.	8.248	3	5.0	5.0	1600.0	20.66	23.79	14.32	NO
300.	7.792	3	3.0	3.0	960.0	27.33	34.62	20.88	NO
400.	7.223	4	4.5	4.5	1440.0	21.73	29.62	15.59	NO
500.	6.878	4	3.5	3.5	1120.0	24.90	36.37	18.74	NO
600.	6.441	4	3.0	3.0	960.0	27.27	42.98	21.74	NO
700.	6.023	4	2.5	2.5	800.0	30.60	49.52	24.70	NO
800.	5.602	4	2.0	2.0	640.0	35.58	56.03	27.71	NO
900.	5.274	4	2.0	2.0	640.0	35.58	62.29	30.31	NO
1000.	4.903	4	2.0	2.0	640.0	35.58	68.50	32.87	NO
1100.	4.625	4	1.5	1.5	480.0	43.89	74.91	35.42	NO
1200.	4.381	4	1.5	1.5	480.0	43.89	81.00	37.32	NO
1300.	4.140	4	1.5	1.5	480.0	43.89	87.04	39.17	NO
1400.	3.908	4	1.5	1.5	480.0	43.89	93.04	40.97	NO
1500.	3.689	4	1.5	1.5	480.0	43.89	99.00	42.74	NO
1600.	3.680	5	1.0	1.0	10000.0	53.78	79.11	31.59	NO
1700.	3.698	5	1.0	1.0	10000.0	53.78	83.49	32.64	NO
1800.	3.698	5	1.0	1.0	10000.0	53.78	87.84	33.67	NO
1900.	3.733	6	1.0	1.0	10000.0	46.29	61.63	23.28	NO
2000.	3.847	6	1.0	1.0	10000.0	46.29	64.48	23.90	NO
2100.	3.906	6	1.0	1.0	10000.0	46.29	67.33	24.43	NO
2200.	3.952	6	1.0	1.0	10000.0	46.29	70.17	24.95	NO
2300.	3.986	6	1.0	1.0	10000.0	46.29	72.99	25.46	NO
2400.	4.010	6	1.0	1.0	10000.0	46.29	75.81	25.97	NO
2500.	4.025	6	1.0	1.0	10000.0	46.29	78.61	26.46	NO
2600.	4.032	6	1.0	1.0	10000.0	46.29	81.40	26.95	NO

2700.	4.031	6	1.0	1.0	10000.0	46.29	84.19	27.43	NO
2800.	4.025	6	1.0	1.0	10000.0	46.29	86.96	27.90	NO
2900.	4.013	6	1.0	1.0	10000.0	46.29	89.73	28.37	NO
3000.	3.997	6	1.0	1.0	10000.0	46.29	92.49	28.83	NO
3500.	3.810	6	1.0	1.0	10000.0	46.29	106.14	30.72	NO
4000.	3.604	6	1.0	1.0	10000.0	46.29	119.60	32.47	NO
4500.	3.398	6	1.0	1.0	10000.0	46.29	132.89	34.13	NO
5000.	3.199	6	1.0	1.0	10000.0	46.29	146.03	35.69	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:

203.	8.250	3	5.0	5.0	1600.0	20.66	24.22	14.57	NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	8.250	203.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 13043 ***

DEWITT CENTRAL FACILITY 3 - FLARE SMSS

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	FLARE
EMISSION RATE (G/S)	=	0.125800
FLARE STACK HEIGHT (M)	=	9.1440
TOT HEAT RLS (CAL/S)	=	106400.
RECEPTOR HEIGHT (M)	=	0.0000
URBAN/RURAL OPTION	=	RURAL
EFF RELEASE HEIGHT (M)	=	10.2970
BUILDING HEIGHT (M)	=	0.0000
MIN HORIZ BLDG DIM (M)	=	0.0000
MAX HORIZ BLDG DIM (M)	=	0.0000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = 1.764 M**4/S**3; MOM. FLUX = 1.076 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
1.	0.000	1	1.0	1.0	320.0	43.03	0.90	0.82	NO
100.	11.47	1	3.0	3.0	960.0	21.21	27.03	14.29	NO
200.	13.10	3	3.0	3.0	960.0	21.20	23.82	14.37	NO
300.	12.23	3	2.0	2.0	640.0	26.65	34.61	20.86	NO
400.	11.43	4	3.0	3.0	960.0	21.18	29.62	15.58	NO
500.	10.75	4	2.5	2.5	800.0	23.36	36.34	18.67	NO
600.	10.08	4	2.0	2.0	640.0	26.62	42.97	21.72	NO
700.	9.377	4	1.5	1.5	480.0	32.07	49.58	24.83	NO
800.	8.757	4	1.5	1.5	480.0	32.07	55.92	27.50	NO
900.	8.050	4	1.5	1.5	480.0	32.07	62.20	30.11	NO
1000.	7.597	4	1.0	1.0	320.0	42.95	68.76	33.42	NO
1100.	7.201	4	1.0	1.0	320.0	42.95	74.89	35.38	NO
1200.	6.801	4	1.0	1.0	320.0	42.95	80.98	37.28	NO
1300.	6.410	4	1.0	1.0	320.0	42.95	87.02	39.13	NO
1400.	6.038	4	1.0	1.0	320.0	42.95	93.02	40.94	NO
1500.	5.688	4	1.0	1.0	320.0	42.95	98.98	42.70	NO
1600.	5.545	6	1.0	1.0	10000.0	39.94	52.68	20.60	NO
1700.	5.719	6	1.0	1.0	10000.0	39.94	55.59	21.27	NO
1800.	5.853	6	1.0	1.0	10000.0	39.94	58.48	21.93	NO
1900.	5.953	6	1.0	1.0	10000.0	39.94	61.37	22.59	NO
2000.	6.021	6	1.0	1.0	10000.0	39.94	64.24	23.23	NO
2100.	6.022	6	1.0	1.0	10000.0	39.94	67.09	23.77	NO
2200.	6.008	6	1.0	1.0	10000.0	39.94	69.94	24.30	NO
2300.	5.980	6	1.0	1.0	10000.0	39.94	72.77	24.83	NO
2400.	5.941	6	1.0	1.0	10000.0	39.94	75.59	25.34	NO
2500.	5.894	6	1.0	1.0	10000.0	39.94	78.41	25.85	NO
2600.	5.838	6	1.0	1.0	10000.0	39.94	81.21	26.35	NO

				SCREEN				
2700.	5.777	6	1.0	1.0 10000.0	39.94	84.00	26.84	NO
2800.	5.710	6	1.0	1.0 10000.0	39.94	86.78	27.33	NO
2900.	5.640	6	1.0	1.0 10000.0	39.94	89.55	27.80	NO
3000.	5.567	6	1.0	1.0 10000.0	39.94	92.31	28.27	NO
3500.	5.133	6	1.0	1.0 10000.0	39.94	105.99	30.19	NO
4000.	4.728	6	1.0	1.0 10000.0	39.94	119.47	31.98	NO
4500.	4.361	6	1.0	1.0 10000.0	39.94	132.77	33.66	NO
5000.	4.032	6	1.0	1.0 10000.0	39.94	145.92	35.24	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:

208.	13.13	3	3.0	3.0 960.0	21.20	24.79	14.93	NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	13.13	208.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

Oil and Gas Standard Permit and Permit By Rule Refined-Screening Modeling Guidelines

The modeling tables in the Oil and Gas Standard Permit and Permit by Rule (PBR) are only one tool the applicant may use to demonstrate emissions from Oil and Gas Site (OGS) located in the Barnett Shale are acceptable under the Standard Permit and PBR. The modeling performed to create the modeling tables demonstrates the Standard Permit and PBR are protective anywhere in the Barnett Shale. In order to make the demonstration, the modeling is based on reasonably conservative assumptions and modeling techniques. If the modeling tables are too conservative for a specific OGS, the applicant may use a more refined screening modeling approach to demonstrate acceptable emissions from an OGS under the Standard Permit and PBR. The following information provides the requirements and guidance if an applicant chooses to conduct the refined screening approach. The applicant should follow the approach exactly and should not modify the approach on a case-by-case basis. However, the commission could modify the modeling guidance to resolve technical issues, clarify instructions, or allow the use of other refined dispersion models.

There are two refined screening options for demonstrating acceptable emission impacts. The first is a screening approach using the SCREEN3 model and the second is a refined screening approach using Industrial Source Complex (ISC) model. It is possible, and acceptable, that some sites may utilize a combination of SCREEN3 and ISC when completing the impacts review.

SCREEN3 Model Setup Guidelines

The information contained in this section will provide guidance for applicants utilizing SCREEN3 in the protectiveness reviews for the Oil and Gas PBR and Standard Permit. If any of the conditions outlined in this guidance cannot be met, then this approach cannot be used.

Control Options

- The Regulatory default option must be selected.
- The Flat terrain choice must be used.
- Rural or urban dispersion options may be used based on the land use in the vicinity of the sources to be permitted.
- A land use analysis must be conducted to determine the majority land-use type within 3 kilometers (km) of the sources to be permitted.
- If the land-use designation is clear (about 70 percent or more of the total land-use is either urban or rural), then no further refinement is required and the model should be run with the appropriate land-use designation.
- If the land-use designation is not clear, the model should be run twice, once with each option and the higher of the two predicted concentrations should be reported.

Source Options

- Emissions can be represented as either point sources, point source using pseudo point parameters, area source, or as a flare.
- Use a point source with pseudo-point parameters for individual fugitive sources and for any sources that do not release to the atmosphere through standard stacks (such as stacks or vents with rain caps, horizontal releases).

- Use area source to characterize emissions from fugitive sources and for any sources that do not release to the atmosphere through standard stacks. The area and release height must represent sources or activities that occur at the same time and height. The ratio of length to width for the area source cannot be greater than 10:1. Multiple area sources can be used as applicable to meet area and release height restrictions.
- Flares may be modeled using the flare source type in SCREEN3 or by calculating the effective stack diameter and using the parameters listed in the ISC model setup guideline. The SCREEN3 flare option assumes an effective stack gas exit velocity (vs) of 20 m/s and an effective stack gas exit temperature (Ts) of 1,273 Kelvin, and calculates an effective stack diameter based on the heat release rate. Enclosed vapor combustion units should not be modeled with the preceding parameters but instead with stack parameters that reflect the physical characteristics of the unit.

Meteorology

- The SCREEN3 model defaults of full meteorology, 10-meter anemometer height, and regulatory mixing height are required.

Receptors

- Model receptors should be placed to meet the definitions listed in 30 TAC §106.352(b)(2), 30 TAC §106.352(k), and sections (b)(2) and (k) of the standard permit.
- The distance to the nearest receptor should be used to demonstrate compliance for the health effects analysis.
- The starting receptor for the state property line and NAAQS analyses should be placed at the nearest property line. The ending receptor should be located at a 1/4 mile, 1/2 mile, or 1 mile from a project for PBR level 1, PBR Level 2, or the standard permit, respectively.

Downwash

- Downwash is generally not applicable for OGS located in rural areas. Downwash may be appropriate for OGS that could be affected by large buildings located in urban areas. Generally, small tanks, storage sheds, and engines are not large enough to cause downwash effects and should not be considered in the analysis.

Output

- The maximum predicted concentration must be used to compare against the applicable ESL, NAAQS, or state ambient air standard.

- The following conversion factors can be used to convert 1-hour concentrations from SCREEN3 to averaging times greater than 1-hour:

Averaging Time	Multiplying Factor
3 hour	0.9
24 hour	0.4
Annual	0.08

ISC Model Setup Guidelines

The information contained in this section will provide guidance for applicants utilizing ISC in the protectiveness reviews for the Oil and Gas PBR and Standard Permits. The latest version of ISC-Prime must be used in the analysis. If any of the conditions outlined in this guidance cannot be met, then this approach cannot be used.

Control Options

- The Regulatory default option must be selected.
- The Flat terrain choice must be used.
- Plume depletion and deposition options are not allowed
- Rural or urban dispersion options may be used based on the land use in the vicinity of the sources to be permitted.
- A land use analysis must be conducted to determine the majority land-use type within 3 km of the sources to be permitted.
- If the land-use designation is clear (about 70 percent or more of the total land-use is either urban or rural), then no further refinement is required and the model should be run with the appropriate land-use designation.
- If the land-use designation is not clear, the model should be run twice, once with each option and the higher of the two predicted concentrations should be reported.

Source Options

- Emissions can be represented as either point sources, point source using pseudo point parameters, area source, or as a flare.
- Use a point source with pseudo-point parameters for individual fugitive sources and for any sources that do not release to the atmosphere through standard stacks (such as stacks or vents with rain caps, horizontal releases).
- Use area source to characterize emissions from fugitive sources and for any sources that do not release to the atmosphere through standard stacks. The area and release height must represent sources or activities that occur at the same time and height. The ratio of length to width for the area source cannot be greater than 10:1. Multiple area sources can be used as applicable to meet area and release height restrictions.

- Flares should be modeled with the following parameters: effective stack exit velocity of 20 meters per second; effective stack exit temperature of 1273 Kelvin; actual height of the flare tip. The effective stack diameter (in meters) should be calculated using the following equation: $D = \sqrt{(10\text{-}6qn)}$ and $qn = q(1 - 0.048\sqrt{MW})$ Where: q = gross heat release in cal/sec; qn = net heat release in cal/sec; and MW = weighted (by volume) average molecular weight of the compound being flared.

Meteorology

- The ADMT prepared meteorological data sets available at www.tceq.state.tx.us/permitting/air/modeling/admtmet.html must be used in the modeling analysis.
- The following table lists the meteorological data sets that should be used for projects located in the corresponding County

Counties	Surface Data	Upper-air Data
Cooke, Dallas, Denton, Ellis, Hood, Johnson, Parker, Somervell, Tarrant, Wise	Dallas-Fort Worth	Stephenville
Archer, Clay, Montague	Wichita Falls	Stephenville
Bosque, Coryell, Hill	Waco	Stephenville
Comanche, Hamilton	San Angelo	Stephenville
Eastland, Erath, Jack, Palo Pinto, Shackelford, Stephens	Abilene	Stephenville

- The required year is 1988 when using one year of meteorology data,
- Only one year of data is required. However, the entire five year data set may be used for NAAQS pollutants.
- The actual anemometer height must be used for each airport location. Anemometer heights can be found at the following URL: www.tceq.state.tx.us/assets/public/permitting/air/memos/anemom96.pdf

Receptors

- Model receptors should be placed to meet the definitions listed in 30 TAC §106.352(b)(2), 30 TAC §106.352(k), and sections (b)(2) and (k) of the standard permit.
- Model receptors should be placed at all locations defined as a receptor within a 1/4 mile, 1/2 mile, or 1 mile from a project for PBR level 1, PBR Level 2, or the standard permit, respectively, to demonstrate compliance with the health effects analysis.
- In addition to meeting the requirements in 30 TAC §106.352(b)(2), 30 TAC §106.352(k), and sections (b)(2) and (k) of the standard permit, the following

receptor grid design should be used when conducting a NAAQS or state property line analysis:

PBR Level 1

- Tight receptors - receptors beginning at the property line and spaced 50 feet apart extending out to a distance of 1/4 mile (1320 feet) from the property line

PBR Level 2

- Tight receptors - receptors beginning at the property line and spaced 50 feet apart extending out to a distance of 1/4 mile (1320 feet) from the property line
- Fine receptors - receptors spaced 300 feet apart beginning at 1/4 mile (1320 feet) from the property line and extending out to a distance of 1/2 mile (2640 feet) from the property line

Standard Permit

- Tight receptors - receptors beginning at the property line and spaced 50 feet apart extending out to a distance of 1/4 mile (1320 feet) from the property line
- Fine receptors - receptors spaced 300 feet apart beginning at 1/4 mile (1320 feet) from the property line and extending out to a distance of 1/2 mile (2640 feet) from the property line
- Medium receptors - receptors spaced 1500 feet apart beginning at 1/2 mile (2640 feet) from the property line and extending out to a distance of extending out to a distance of 1 mile (5280 feet)

Downwash

- Downwash is generally not applicable for OGS located in rural areas. Downwash may be appropriate for OGS that could be affected by large buildings located in urban areas. Generally, small tanks, storage sheds, and engines are not large enough to cause downwash effects and should not be considered in the analysis.
- The latest version of BPIP-Prime should be used to calculate downwash parameters if downwash is appropriate.

Coordinate System

- Enter receptor locations, source locations, and building location (if necessary) in UTM coordinates
- UTM coordinates in datum NAD27 or NAD83 must be used. Make certain that all of the coordinates originated in, or are converted to, the same horizontal datum. Applicable UTM zone for the Barnett Shale is zone 14 (between 102 and 96 degrees longitude).
- Coordinate systems based on plant coordinates, applicant-developed coordinate systems, or polar grids will not be accepted.

Output

- The maximum predicted concentration must be used to compare against the applicable ESL, NAAQS, or state ambient air standard when using one year of meteorological data.
- The *high*, second high may be used when modeling with 5 years of meteorology data for the SO_2 3-hr, SO_2 24-hr, SO_2 annual, and NO_2 annual NAAQS.
- The form of the standard may be used be used when modeling with 5 years of meteorology data for the SO_2 and NO_2 1-hr NAAQS.
- The modeling form of the standard for the 1-hr NO_2 NAAQS is based on the 5-year average of the annual 98th percentile of the daily maximum 1-hour concentrations.
- The modeling form of the standard for the 1-hr SO_2 is based on the 5-year average of the annual 99th percentile of the daily maximum 1-hour concentrations.

Review Type Guidelines

The following section contains the required procedures necessary to complete a health effects, NAAQS, and state property line evaluations. The applicant should follow the steps exactly and should not modify the approach on a case-by-case basis. However, the commission could modify the guidance to resolve technical issues, clarify instructions, or allow the use of more refined models.

In addition to following the approaches below, the evaluations must meet the requirements listed in 30 TAC §106.352(k) and section (k) of the standard permit, as appropriate.

Health Effects Analysis

- Compliance with the hourly ESL for benzene and annual ESL for benzene must be demonstrated at receptors within 1/4 mile, 1/2 mile, or 1 mile of a project for PBR Level 1, PBR Level 2, or the standard permit, respectively
- Model all new and modified sources -- the project.
- If the project's air contaminant maximum predicted concentration is equal to or less than 10% of the appropriate ESL, no further review is required.
- If a project's air contaminant maximum predicted concentration is greater than 10% of the appropriate ESL, compare the project's air contaminant maximum predicted concentration combined with project increases for that contaminant over a 60-month period to 25% of the appropriate ESL. If the resulting concentration is less than 25% of the appropriate ESL, no further review is required.
- A site wide analysis, including all sources emitting the regulated contaminant, must be conducted if the above requirements are not met. Multiple scenarios may be necessary to represent sources that may not operate simultaneously.
- All sources must be modeled at the maximum allowable emission rate.
- The maximum predicted concentration at each receptor should be compared to the ESL and included in the modeling report.

State Property Line Analysis

- Compliance with the state ambient air standard for SO_2 and H_2S must be demonstrated at any property line within 1/4 mile, 1/2 mile, or 1 mile of a project for PBR level 1, PBR Level 2, or the standard permit, respectively
- Model all new and modified sources-- the project.
- Compare the maximum predicted concentration from the project to the appropriate de minimis level. Compliance with the state property line standards is demonstrated if the maximum predicted concentration from the project is less than or equal to de minimis listed in the following table:

Pollutant	Averaging Time	Location	De Minimis ($\mu g/m^3$)
SO_2	1-hr	All locations	20
H_2S	1-hr	If property is residential, recreational, business, or commercial	2
H_2S	1-hr	If property is other than residential, recreational, business, or commercial	3

- If the maximum predicted concentration from the project is greater than de minimis, a site wide analysis must be conducted.
- Model the allowable emission rate of all sources on site that emit the regulated pollutant.
- Compliance with the state property line standard is demonstrated if the maximum predicted site-wide concentration is less than or equal to the state property line standards listed in the following table:

Pollutant	Averaging Time	Location	State Property Line Standard ($\mu g/m^3$)
SO_2	1-hr	All Locations	1021
H_2S	1-hr	If property is residential, recreational, business, or commercial	108
H_2S	1-hr	If property is other than residential, recreational, business, or commercial	162

NAAQS Analysis

- Compliance with federal ambient air standards for NO_2 and SO_2 must be demonstrated at any property line within 1/4 mile, 1/2 mile, or 1 mile of a project for PBR Level 1, PBR Level 2, or the standard permit, respectively
- Model all new and modified sources-- the project.
- Compare the maximum predicted concentration from the project to the appropriate de minimis level. Compliance with the NAAQS is demonstrated if the maximum predicted concentration from the project is less than or equal to the de minimis level listed in the following table:

Pollutant	Averaging Time	De Minimis ($\mu g/m^3$)
SO_2	1-hr	7.8
SO_2	3-hr	25
SO_2	24-hr	5
SO_2	Annual	1
NO_2	1-hr	7.5
NO_2	Annual	1

- If the maximum predicted concentration from the project is greater than de minimis, a site wide analysis must be conducted.
- Model the allowable emission rate of all sources on site that emit the regulated pollutant
- The maximum predicted concentration must be used when modeling with one year of meteorology data.
- The *high*, second high may be used when modeling with 5 years of meteorology data for the SO_2 3-hr, SO_2 24-hr, SO2 annual, and NO_2 annual NAAQS.
- The form of the standard may be used be used when modeling with 5 years of meteorology data for the SO_2 and NO_2 1-hr NAAQS.

- Add a background concentration to the predicted site wide concentration and compare the total concentration to the NAAQS. Compliance with the NAAQS is demonstrated if the total concentration is less than NAAQS listed in the following table:

Pollutant	Averaging Time	NAAQS ($\mu g/m^3$)
SO_2	1-hr	196
SO_2	3-hr	1300
SO_2	24-hr	365
SO_2	Annual	80
NO_2	1-hr	188
NO_2	Annual	100

- Screening background concentration values can be found at www.tceq.texas.gov/permitting/air/memos/interim_guidance_naaqs.html
- If the screening background concentration values are too conservative, contact the Air Dispersion Modeling Team at 512-239-1250 for further guidance. The applicant should be prepared to present and discuss alternative background concentrations.

Streamlining Techniques

The following section contains approaches that may be used to streamline the modeling required to demonstrate compliance with the health effects, NAAQS, or state property line analysis. The streamlining techniques are **NOT** required, but may be used to streamline the analyses.

Controlling Concentrations

Short-term standards are usually the controlling concentrations; that is, if the standard is met for the shortest time period, standards for longer averaging periods will also be met. Therefore, if the predicted concentrations from the maximum 1-hour emissions for a NAAQS or applicable state standard are at or lower than the concentrations from a longer averaging period, the demonstration is complete. For example, if the predicted 1-hour SO_2 concentration is 150 $\mu g/m^3$, the demonstration for all SO_2 NAAQS and state standards except the annual NAAQS is complete. However, the screening conversion factor of 0.08 can be used to convert the hourly concentration to an annual concentration, and in this case, the annual NAAQS will not be exceeded. Document the use of this technique in the modeling report.

Collocation of Emission Points

Collocating stacks may be appropriate for both screening and refined analyses if the individual emission points emit the same pollutant(s); have stack heights, volumetric flow rates, or stack gas exit temperatures that do not differ by more than about 20 percent; and are within about 100 meters of each other.

- Use the following equation to determine the worst-case stack: $M = (h_s V T_s)/Q$
- Where:
  - M = a parameter that accounts for the relative influence of stack height, plume rise, and emission rate on concentrations;
  - h_s = the physical stack height in meters;
  - $V = (\pi/4)d^2 v_s$ = the stack gas flow rate in cubic meters per second.
  - Π = pi
  - d = inside stack diameter in meters;
  - v_s = stack gas exit velocity in meters per second;
  - T_s = the stack gas exit temperature in Kelvin;
  - Q = pollutant emission rate in grams per second.
- The stack that has the lowest value of M is used as a representative stack.
- The sum of the emissions from all stacks is assumed to be emitted from the representative stack.

Generic Modeling Approach

This technique uses a unit emission rate (1 pound per hour) to determine if the maximum contribution from each permitted source when added together, independent of time and space, could exceed a standard or ESL. This is a conservative procedure since the maximum concentration from all sources modeled concurrently cannot be more than the sum of the maximum concentration from each source modeled separately.

- Determine a generic impact for each source by modeling each source with a unit emission rate of 1 pound per hour; the source's actual location; and the source's proposed stack parameters represented in the permit application.
- In ISC this is done by setting up a separate source group for each source.
- The SCREEN3 model can also be used for this demonstration with a separate SCREEN3 model run for each source.
- Multiply the predicted generic impact by the proposed pollutant specific emission rate for each source to calculate a maximum predicted concentration for each source.
- Sum the maximum predicted concentration for each source to get a total predicted concentration for each pollutant.
- The sum of the maximum concentrations (for each pollutant, independent of time and space) is then compared with the threshold of concern for each pollutant.

Reporting Requirements

Once the modeling exercise is complete, the modeling approach and results should be summarized in a modeling report. The modeling report should be sent to the TCEQ permit reviewer and include a CD with all modeling input files, plot files, output files and all other files of supporting information used in the modeling demonstration.

Interim 1-Hour NO_2 Screening Background Concentrations in micrograms per cubic meter ($\mu g/m^3$)[1]			
Region / Specific County[2]	Screening Background	Region / Specific County	Screening Background
1	70	10	70
		Jefferson	90
		Orange	70
2	70		
3	70	11	70
		Travis	85
4	70	12	70
Dallas	104	Brazoria	75
Ellis	85	Galveston	75
Tarrant	107	Harris	120
		Montgomery	75
5	70	13	70
Titus	90	Bexar	100
Rusk	90		
6	70	14	70
El Paso	124	Nueces	90
7	70	15	70
		Hildalgo	100
8	70	16	70
		Webb	100
9	70		
Freestone	90		
Limestone	90		

These values are conservative and based on available ambient monitoring design values (2007-2009) and may change as more research is conducted and/or data obtained.

If a value is too conservative, contact the Air Dispersion Modeling Team to determine if a more refined background concentration is available.

[1] Use the value for the region the project will be located in, or county if listed
[2] NAAQS in 188 $\mu g/m^3$ converted from parts per billion based on standard temperature and pressure

Texas Natural Resource Conservation Commission

INTEROFFICE MEMORANDUM

TO: NSRPD Staff **DATE:** August 3, 1998

FROM: Dom Ruggeri, Team Leader
Air Dispersion Modeling Team (ADMT)

SUBJECT: Modeling Guidance for Exemption 106.512 (Formerly SE 6)

If an applicant meets the general requirements to claim an exemption under this rule, the applicant must demonstrate that emissions from an exempted source will not cause or contribute to a violation of the NO_2 NAAQS [106.512(6)]. One of the methods to show compliance with the NO_2 NAAQS involves dispersion modeling [106.512(6)(A)]. The applicant can use the following procedure to conduct the modeling demonstration:

Step 1. *Determine the long-term hourly emission rate for each source.*
Use the applicable NO_2/NO_x ratio in Figure 1: 30 TAC §106.512(6)(A) to adjust the hourly rate for each source.

Step 2. *Determine if the NO_2 de minimis is exceeded.*
Use EPA's SCREEN3 or ISCST3 model to determine if the new or modified sources' emissions will exceed the NO_2 de minimis of 1 $\mu g/m^3$. If the predicted concentration is $\leq$ 1 $\mu g/m^3$, the demonstration is complete. If not, go to Step 3.

Step 3. *Determine the background concentration from the Screening Background Concentrations table (attached).* If the predicted concentration plus background is $\leq$ 100 $\mu g/m^3$, the demonstration is complete. If not, a full state NAAQS analysis may be required if the screening background concentration cannot be refined to a more representative value. Go to Step 4.

Step 4. *Determine if there is a NO_2 monitor in the county.* If not, go to Step 5.
Obtain a background concentration from a representative monitor in the county. Use the most recent annual concentration from the Aerometric Information Retrieval System (AIRS) [www.epa.gov/airsweb/monreps.htm] that is based on at least 6570 hours of observations.

Convert the concentration from ppm to $\mu g/m^3$ by multiplying the AIRS concentration by 1887. If the predicted concentration plus the monitored background concentration is $\leq$ 100 $\mu g/m^3$, the demonstration is complete. If not, a full state NAAQS analysis may be required. Contact the ADMT staff for modeling guidance.

Step 5. *Contact the ADMT staff for assistance in developing a representative background concentration.* If the predicted concentration plus a representative background concentration is $\leq$ 100 $\mu g/m^3$, the demonstration is complete. If not, a full state NAAQS analysis may be required. Contact the ADMT staff for modeling guidance.

Attachment

SCREENING BACKGROUND CONCENTRATIONS
NO_2
August, 1998

Note: Use regional values unless concentrations for a specific county are provided.

Regional Background / Specific County Background - Annual Concentration ($\mu g/m^3$)							
Region 1 20	Region 2 20	Region3 20	Region 4 20	Region 5 20	Region 6 20	Region 7 20	Region 8 20
Potter 25	Lubbock 25	Wichita 25	Collin 25	Rusk 30	El Paso 70	Ector 35	
			Dallas 55	Smith 25			
			Denton 25	Titus 30			
			Ellis 25				
			Tarrant 40				

Regional Background / Specific County Background - Annual Concentration ($\mu g/m^3$)							
Region 9 20	Region 10 20	Region 11 20	Region 12 20	Region 13 20	Region 14 20	Region 15 20	Region 16 20
Bell 40	Jefferson 35	Fayette 30	Brazoria 35	Bexar 50	Nueces 35	Cameron 30	Webb 25
Limestone 25	Orange 35	Travis 45	Chambers 25		Victoria 25	Hidalgo 30	
McLennan 30		Williamson 25	Ft. Bend 35				
Robertson 35			Galveston 30				
			Harris 60				
			Montgomery 25				

Texas Natural Resource Conservation Commission

INTEROFFICE MEMORANDUM

TO: NSRPD Technical Staff **DATE:** September 4, 1998

FROM: Dom Ruggeri, Team Leader
Air Dispersion Modeling Team (ADMT)

SUBJECT: Screening Background Concentrations

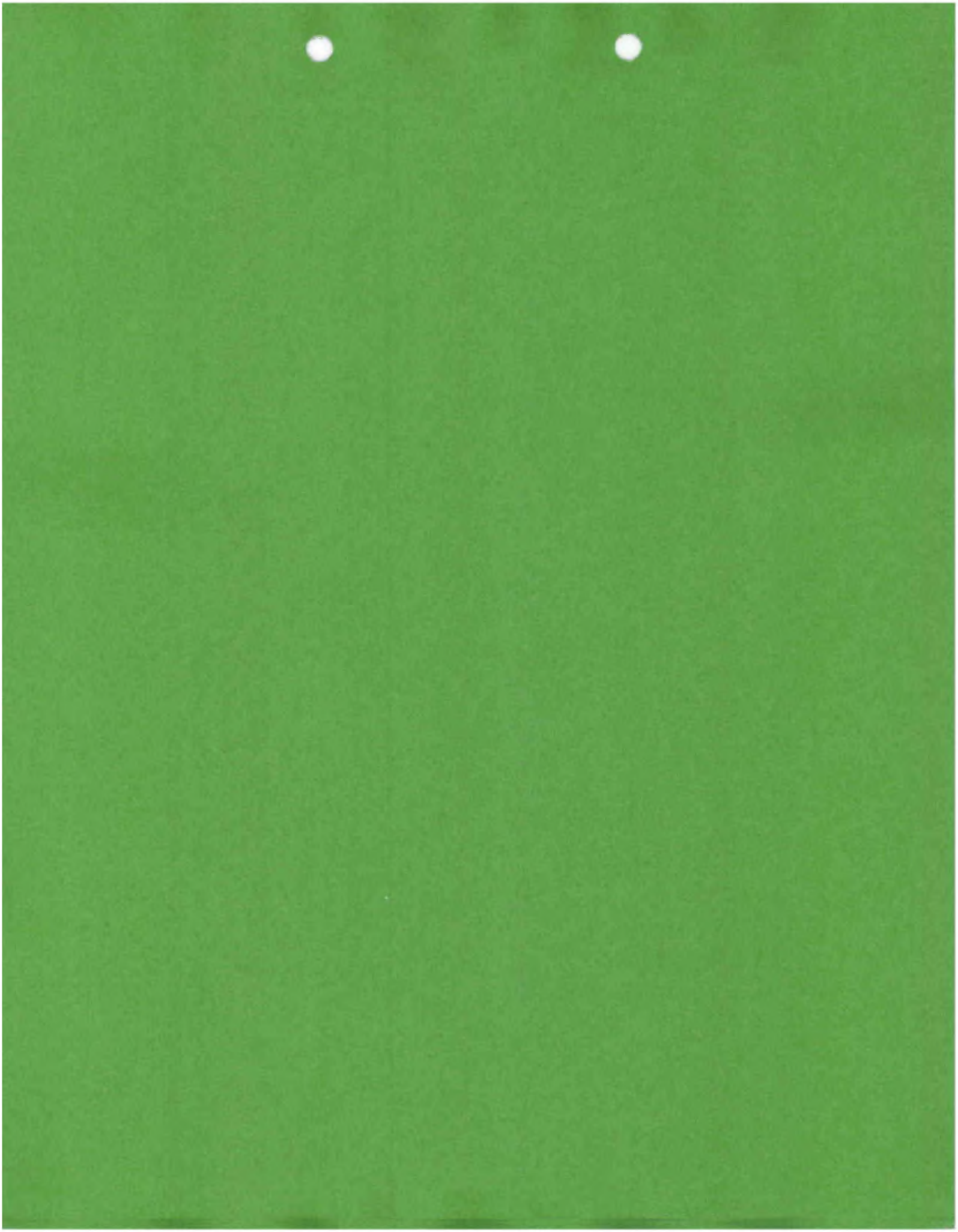
The concentrations in the attached tables were developed for use with the Modeling Request Flowchart. They were determined based on a statewide review of: the highest monitored values during 1992-1997 for sulfur dioxide (SO_2), nitrogen dioxide (NO_2), particulate matter with an aerodynamic diameter of 10 microns or less (PM_{10}), lead (Pb), and carbon monoxide (CO); countywide point source emissions; and population, as a surrogate for non-point source emissions. These concentrations are meant to be conservative, since they were developed for use primarily in the screening modeling process.

The tables contain the highest background concentrations expected within a TNRCC region. For some projects, additional refinement of screening background concentrations may be appropriate, particularly in areas with multiple ambient air monitors. ADMT staff can assist in the determination of more refined screening background concentrations on a case-by-case basis.

Attachments

	Pollutant / Averaging Period / Standard / Background Concentration								
Region/ Specific County	Pb Quarter 1.5	CO 1-Hour 33400	CO 8-Hour 10000	PM_{10} 24-Hour 150	PM_{10} Annual 50	NO_2 Annual 100	SO_2 3-Hour 1300	SO_2 24-Hour 365	SO_2 Annual 80
13-	0.1	4000	1000	60	20	20	130	36	8
Atascosa							780	200	24
Bexar	0.4	20000	9800	120	40	50	1040	275	40
Comal				75	25				

	Pollutant / Averaging Period / Standard / Background Concentration								
Region/ Specific County	Pb Quarter 1.5	CO 1-Hour 40000	CO 8-Hour 10000	PM_{10} 24-Hour 150	PM_{10} Annual 50	NO_2 Annual 100	SO_2 3-Hour 1300	SO_2 24-Hour 365	SO_2 Annual 80
14-	0.1	4000	1000	60	20	20	130	36	8
Aransas		10000	5000				260	75	12
Calhoun				75	25		260	75	12
Goliad							910	220	32
Nueces		14000	7000	105	35	35	910	220	32
Victoria		10000	5000			25			



ATTACHMENT 6
SUPPORTING DOCUMENTATION

OIL AND GAS STANDARD PERMIT REGISTRATION

DEWITT CENTRAL FACILITY 3

BURLINGTON RESOURCES OIL & GAS COMPANY LP

Description **Page**

Facility/Compound Specific Fugitive Emission Factors

Equipment/ Service	Ethylene Oxide [1]	Phosgene [2]	Butadiene [3]	Petroleum Marketing Terminal [4]	Oil and Gas Production Operations [5]				Refinery [6]
					Gas	Heavy Oil <20° API	Light Oil >20°	Water/Light Oil	
Valves					0.00992	0.0000185	0.0055	0.000216	
Gas/Vapor	0.000444	0.00000216	0.001105	0.0000287					0.059
Light Liquid	0.00055	0.00000199	0.00314	0.0000948					0.024
Heavy Liquid				0.0000948					0.00051
Pumps	0.042651	0.0000201	0.05634		0.00529	0.00113 [10]	0.02866	0.000052	
Light Liquid				0.00119					0.251
Heavy Liquid				0.00119					0.046
Flanges/Connectors	0.000555	0.00000011	0.000307		0.00086	0.00000086	0.000243	0.000006	0.00055
Gas/Vapor				0.000092604					
Light Liquid				0.00001762					
Heavy Liquid				0.0000176					
Compressors	0.000767		0.000004		0.0194	0.0000683	0.0165	0.0309	1.399
Relief Valve	0.000165	0.0000162	0.02996		0.0194	0.0000683	0.0165	0.0309	0.35
Open-ended Lines [7]	0.001078	0.00000007	0.00012		0.00441	0.000309	0.00309	0.00055	0.0051
Sampling	0.000088		0.00012						0.033
Connectors					0.00044	0.0000165	0.000463	0.000243	
Other [9]					0.0194	0.0000683	0.0165	0.0309	
Gas/Vapor				0.000265					
Light/Heavy Liquid				0.000287					
Process Drains					0.0194	0.0000683	0.0165	0.0309	0.07

Table Notes: All factors are in units of (lb/hr)/component.

1. Monitoring must occur at a leak definition of 500 ppmv. No additional control credit can be applied to these factors. Emission factors are from EOIC Fugitive Emission Study, Summer 1988.

2. Monitoring must occur at a leak definition of 50 ppmv. No additional control credit can be applied to these factors. Emission factors are from Phosgene Panel Study, Summer 1988.

3. Monitoring must occur at a leak definition of 100 ppmv. No additional control credit can be applied to these factors. Emission factors are from Randall, J. L., et al., Radian Corporation. Fugitive Emissions from the 1,3-butadiene Production Industry: A Field Study. Final Report. Prepared for the 1,3-Butadiene Panel of the Chemical Manufacturers Association. April 1989.

4. Control credit is included in the factor; no additional control credit can be applied to these factors. Monthly AVO inspection required.

5. Factors give the total organic compound emission rate. Multiply by the weight percent of non-methane, non-ethane organics to get the VOC emission rate.

6. Factors are taken from EPA Document EPA-453/R-95-017, November 1995, Page 2-13.

7. The 28 Series quarterly LDAR programs require open-ended lines to equipped with a cap, blind flange, plug, or a second valve. If so equipped, open-ended lines may be given a 100% control credit.

8. Emission factor for Sampling Connections is in terms of pounds per hour per sample taken.

9. For Petroleum Marketing Terminals"Other" includes any component excluding fittings, pumps, and valves. For Oil and Gas Production Operations, "Other" includes diaphragms, dump arms, hatches, instruments, meters, polished rods, and vents.

10. No Heavy Oil - Pump factor was derived during the API study. The factor is the SOCMI without C_2 Heavy Liquid - Pump factor with a 93% reduction credit for the physical inspection.

Tank Truck Loading of Crude Oil or Condensate

Scope: Tank Truck Loading activities at loading terminals

The transportation and marketing of petroleum liquids involve many distinct operations, each of which represents a potential source of evaporation loss. Crude oil or condensate is transported from oil and gas sites to a refinery or other refining operations by tankers, barges, rail tank cars, tank trucks, and pipelines.

Loading losses are the primary source of evaporative emissions from rail tank car, tank truck, and marine vessel operations (for marine loading please review Marine Loading of Crude Oil and Condensate Guidance Document). Loading losses occur as organic vapors in "empty" cargo tanks are displaced to the atmosphere by the liquid being loaded into the tanks. These vapors are a composite of (1) vapors formed in the empty tank by evaporation of residual product from previous loads, (2) vapors transferred to the tank in vapor balance systems as product is being unloaded, and (3) vapors generated in the tank as the new product is being loaded. The quantity of evaporative losses from loading operations is, therefore, a function of the following parameters:

- Physical and chemical characteristics of the previous cargo;
- Method of unloading the previous cargo;
- Operations to transport the empty carrier to a loading terminal;
- Method of loading the new cargo; and
- Physical and chemical characteristics of the new cargo.

Tank truck loading operations can be divided into three general categories: A) atmospheric trucks, B) pressure trucks used in atmospheric service, and C) pressure trucks. The type of connection that is used in the loading procedure will be considered to determine the collection efficiency. "Quick connects" are clamp type connections that are not bolted or flanged. "Quick connects" can be used with atmospheric trucks. Hard-piped connections are bolted or flanged to the receiving vessel. Hard-piped connections should be used with pressure trucks to achieve its maximum collection efficiency. Atmospheric trucks must be leak checked according to NSPS Subpart XX to achieve its maximum collection efficiency.

Tank Truck Loading Authorizations

All stationary facilities, or groups of facilities, at a site which handle gases and liquids associated with the production, conditioning, processing, and pipeline transfer of fluids or gases found in geologic formations on or beneath the earth's surface including, but not limited to, crude oil, natural gas, condensate, and produced water that satisfy the general conditions of Title 30, Texas Administrative Code (30 TAC), Section 106.4, and the specific conditions of 30 TAC Section 106.352 are permitted by rule. The commission also has available rule language in an easy-to-read format for the permit by rule.

For all new projects and dependent facilities not located in the Barnett Shale counties, the current 106.352 subsection (l) is applicable, which contains the previous requirements of 106.352.

For projects located in one of the Barnett Shale counties which are constructed or modified on or after April 1, 2011 subsections (a)-(k) apply.

Other permit by rules which may be used for tank truck loading but are not commonly seen are 106.261, 106.262, 106.472, and 106.473.

If a site does not qualify for a PBR, it may be authorized by a standard permit. Sites constructed prior to April 1, 2011 may be authorized using the Oil and Gas Standard Permit (30 TAC 116.620, effective January 11, 2000). For sites in one of the Barnett Shale counties constructed or modified on or after April 1, 2011, the site is subject to the requirements of the Air Quality Standard Permit for Oil and Gas Handling and Production Facilities.

Emission Calculations

Loading calculations are listed in AP-42, Chapter 5, Section 5.2: Transportation and Marketing of Petroleum Liquids.

Submerged tank truck loading is the minimum level of control required. The two types of submerge loading are the submerged fill pipe method and the bottom loading method. In the submerged fill pipe method, the fill pipe extends almost to the bottom of the cargo tank. In the bottom loading method, a permanent fill pipe is attached to the cargo tank bottom. During most of submerged loading by both methods, the fill pipe opening is below the liquid surface level. Liquid turbulence is controlled significantly during submerged loading, resulting in much lower vapor generation than encountered during splash loading.

The saturation factor, S, represents the expelled vapor's fractional approach to saturation, and it accounts for the variations observed in emission rates from the different unloading and loading methods. The loading calculation requires the use of a Saturation Factor (S factor) listed in Table 5.2-1, Saturation (S) Factors for Calculating Petroleum Liquid Loading Losses.

Submerged loading: dedicated normal service, S factor = 0.6

The S factor of 0.6 should be used if the tank truck is in "dedicated normal service". Dedicated normal service means the tank truck is used to transport only one product or products with similar characteristics (petroleum products with similar API gravity, molecular weight, vapor pressure).

Submerged Loading: dedicated vapor balance, S factor = 1.0

The S factor of 1.0 should be used if the loading vapors are returned back to the tank truck when it is unloaded to a storage tank or other vessel.

Emissions from loading petroleum liquid can be estimated using the following expression:

Where:

$$L_L = 12.46 \frac{SPM}{T}$$

- LL= loading loss, pounds per 1000 gallons (lb/103 gal) of liquid loaded
- S = a saturation factor (see Table 5.2-1)

- P = true vapor pressure of liquid loaded, pounds per square inch absolute (psia) (see Section 7.1, "Organic Liquid Storage Tanks")
- M = molecular weight of vapors, pounds per pound-mole (lb/lb-mole) (see Section 7.1, "Organic Liquid Storage Tanks")
- T = temperature of bulk liquid loaded, °R (°F + 460)

Emissions are broken down into short-term emissions (lb/hr) and annual emissions (tons/year). Short-term emissions should be estimated by using the maximum expected vapor pressure and temperature of the compound being loaded and the maximum expected pumping rate being used to fill the container (loading tank truck). Annual emissions should be estimated by using the average annual temperature and corresponding vapor pressure of the compound and the expected annual throughput of the compound.

Capture/Collection techniques and efficiency

The overall reduction efficiency should account for the capture efficiency of the collection system as well as both the control efficiency and any downtime of the control device. Measures to reduce loading emissions include selection of alternate loading methods and application of vapor recovery equipment.

Please note,not all of the displaced vapors reach the control device, because of leakage from both the tank truck and collection system. The collection efficiency should be assumed to be 98.7 percent for tanker trucks passing an annual leak test per EPA standards. A collection efficiency of 70 percent should be assumed for trucks which are not leak tested.

- 70% capture/collection efficiency if not leak tested
- 98.7% capture/collection efficiency if leak tested based on EPA standards (NSPS Subpart XX)
- 100% capture/collection efficiency if a blower system is installed which will produce a vacuum in the tank truck during all loading operations. A pressure/vacuum gauge shall be installed on the suction side of the loading rack blower system adjacent to the truck being loaded to verify a vacuum in that vessel. Loading shall not occur unless there is a vacuum of at least 1.5 inch water column being maintained by the vacuum-assist vapor collection system when loading trucks. The vacuum shall be recorded every 15 minutes during loading.

Uncollected Loading Emissions

Uncollected loading emissions are referred to as loading fugitives and are listed as a separate emission point or source. Uncollected loading emissions (LLF) can be estimated using the following expression:

$$L_{LF} = (L_L) \frac{(1 - \text{Collection Efficiency})}{100}$$

Control techniques and control efficiencies

Emissions from controlled loading operations can be calculated by multiplying the uncontrolled emission rate calculated in the loading loss equation (LL) by an overall reduction efficiency term:

$$\text{Emissions} = (L_L)\left(\frac{\text{Collection Efficiency}}{100}\right)\left(1 - \frac{\text{Control Efficiency}}{100}\right)$$

- Flares – Flares must meet 40 CFR 60.18 requirements of minimum heating value of waste gas and a maximum flare tip velocity. Flares can have a control efficiency of 98% or 99% for the following compounds: methanol, ethanol, propanol, ethylene oxide, and propylene oxide. The agency highly encourages the consideration of variable speed blowers when a control efficiency of > 98% is claimed for a steam – assisted flare to reduce over steaming of the flare which could affect the control efficiency.
- Thermal oxidizers – must be designed for the variability of the waste gas stream and basic monitoring which consists of thermocouple or infrared monitor that indicates the device is working. Control efficiencies range from 95% - <99%.
- Carbon Systems – Can claim up to a 98% control efficiency. The carbon system must have an alarm system that will prevent break through.
- Vapor Recovery Units (VRU) – Can claim up to 100% control. Designed systems claiming 100% control must submit the requirements found in the Vapor Recovery Unit Capture/Control Guidance.

Note: Loading cannot occur while the control system is off-line.

Vapor balancing is NOT a form of control; it is only a capture techniqu.

Flare Emission Factors

The usual flare destruction efficiencies and emission factors are provided in Table 4. The high-Btu waste streams referred to in the table have a heating value greater than 1,000 Btu/scf.

Flare Destruction Efficiencies

Claims for destruction efficiencies greater than those listed in Table 4 will be considered on a case-by-case basis. The applicant may make one of the three following demonstrations to justify the higher destruction efficiency: (1) general method, (2) 99.5 percent justification, or (3) flare stack sampling.

Table 4. Flare Factors

Waste Stream	Destruction/Removal Efficiency (DRE)		
VOC	98 percent (generic)		
	99 percent for compounds containing no more than 3 carbons that contain no elements other than carbon and hydrogen in addition to the following compounds: methanol, ethanol, propanol, ethylene oxide and propylene oxide		
H_2S	98 percent		
NH_3	case by case		
CO	case by case		
Air Contaminants	**Emission Factors**		
thermal NO_x	steam-assist:	high Btu	0.0485 lb/MMBtu
		low Btu	0.068 lb/MMBtu
	other:	high Btu	0.138 lb/MMBtu
		low Btu	0.0641 lb/MMBtu
fuel NO_x	NO_x is 0.5 wt percent of inlet NH_3, other fuels case by case		
CO	steam-assist:	high Btu	0.3503 lb/MMBtu
		low Btu	0.3465 lb/MMBtu
	other:	high Btu	0.2755 lb/MMBtu
		low Btu	0.5496 lb/MMBtu
PM	none, required to be smokeless		
SO_2	100 percent S in fuel to SO_2		

Table 3.2-2. UNCONTROLLED EMISSION FACTORS FOR 4-STROKE LEAN-BURN ENGINES[a]
(SCC 2-02-002-54)

Pollutant	Emission Factor (lb/MMBtu)[b] (fuel input)	Emission Factor Rating
Criteria Pollutants and Greenhouse Gases		
NO_x[c] 90 - 105% Load	4.08 E+00	B
NO_x[c] <90% Load	8.47 E-01	B
CO[c] 90 - 105% Load	3.17 E-01	C
CO[c] <90% Load	5.57 E-01	B
CO_2[d]	1.10 E+02	A
SO_2[e]	5.88 E-04	A
TOC[f]	1.47 E+00	A
Methane[g]	1.25 E+00	C
VOC[h]	1.18 E-01	C
PM10 (filterable)[i]	7.71 E-05	D
PM2.5 (filterable)[i]	7.71 E-05	D
PM Condensable[j]	9.91 E-03	D
Trace Organic Compounds		
1,1,2,2-Tetrachloroethane[k]	<4.00 E-05	E
1,1,2-Trichloroethane[k]	<3.18 E-05	E
1,1-Dichloroethane	<2.36 E-05	E
1,2,3-Trimethylbenzene	2.30 E-05	D
1,2,4-Trimethylbenzene	1.43 E-05	C
1,2-Dichloroethane	<2.36 E-05	E
1,2-Dichloropropane	<2.69 E-05	E
1,3,5-Trimethylbenzene	3.38 E-05	D
1,3-Butadiene[k]	2.67E-04	D
1,3-Dichloropropene[k]	<2.64 E-05	E
2-Methylnaphthalene[k]	3.32 E-05	C
2,2,4-Trimethylpentane[k]	2.50 E-04	C
Acenaphthene[k]	1.25 E-06	C

Table 3.2-2. UNCONTROLLED EMISSION FACTORS FOR 4-STROKE LEAN-BURN ENGINES
(Continued)

Pollutant	Emission Factor (lb/MMBtu)[b] (fuel input)	Emission Factor Rating
Acenaphthylene[k]	5.53 E-06	C
Acetaldehyde[k,l]	8.36 E-03	A
Acrolein[k,l]	5.14 E-03	A
Benzene[k]	4.40 E-04	A
Benzo(b)fluoranthene[k]	1.66 E-07	D
Benzo(e)pyrene[k]	4.15 E-07	D
Benzo(g,h,i)perylene[k]	4.14 E-07	D
Biphenyl[k]	2.12 E-04	D
Butane	5.41 E-04	D
Butyr/Isobutyraldehyde	1.01 E-04	C
Carbon Tetrachloride[k]	<3.67 E-05	E
Chlorobenzene[k]	<3.04 E-05	E
Chloroethane	1.87 E-06	D
Chloroform[k]	<2.85 E-05	E
Chrysene[k]	6.93 E-07	C
Cyclopentane	2.27 E-04	C
Ethane	1.05 E-01	C
Ethylbenzene[k]	3.97 E-05	B
Ethylene Dibromide[k]	<4.43 E-05	E
Fluoranthene[k]	1.11 E-06	C
Fluorene[k]	5.67 E-06	C
Formaldehyde[k,l]	5.28 E-02	A
Methanol[k]	2.50 E-03	B
Methylcyclohexane	1.23 E-03	C
Methylene Chloride[k]	2.00 E-05	C
n-Hexane[k]	1.11 E-03	C
n-Nonane	1.10 E-04	C

Table 3.2-2. UNCONTROLLED EMISSION FACTORS FOR 4-STROKE LEAN-BURN ENGINES
(Continued)

Pollutant	Emission Factor (lb/MMBtu)[b] (fuel input)	Emission Factor Rating
n-Octane	3.51 E-04	C
n-Pentane	2.60 E-03	C
Naphthalene[k]	7.44 E-05	C
PAH[k]	2.69 E-05	D
Phenanthrene[k]	1.04 E-05	D
Phenol[k]	2.40 E-05	D
Propane	4.19 E-02	C
Pyrene[k]	1.36 E-06	C
Styrene[k]	<2.36 E-05	E
Tetrachloroethane[k]	2.48 E-06	D
Toluene[k]	4.08 E-04	B
Vinyl Chloride[k]	1.49 E-05	C
Xylene[k]	1.84 E-04	B

[a] Reference 7. Factors represent uncontrolled levels. For NO_x, CO, and PM10, "uncontrolled" means no combustion or add-on controls; however, the factor may include turbocharged units. For all other pollutants, "uncontrolled" means no oxidation control; the data set may include units with control techniques used for NOx control, such as PCC and SCR for lean burn engines, and PSC for rich burn engines. Factors are based on large population of engines. Factors are for engines at all loads, except as indicated. SCC = Source Classification Code. TOC = Total Organic Compounds. PM-10 = Particulate Matter ≤ 10 microns (μm) aerodynamic diameter. A "<" sign in front of a factor means that the corresponding emission factor is based on one-half of the method detection limit.

[b] Emission factors were calculated in units of (lb/MMBtu) based on procedures in EPA Method 19. To convert from (lb/MMBtu) to (lb/10^6 scf), multiply by the heat content of the fuel. If the heat content is not available, use 1020 Btu/scf. To convert from (lb/MMBtu) to (lb/hp-hr) use the following equation:

$$\text{lb/hp-hr} = (\text{lb/MMBtu})\ (\text{heat input, MMBtu/hr})\ (1/\text{operating HP, 1/hp})$$

[c] Emission tests with unreported load conditions were not included in the data set.

[d] Based on 99.5% conversion of the fuel carbon to CO_2. CO_2 [lb/MMBtu] = (3.67)(%CON)(C)(D)(1/h), where %CON = percent conversion of fuel carbon to CO_2, C = carbon content of fuel by weight (0.75), D = density of fuel, 4.1 E+04 lb/10^6 scf, and

h = heating value of natural gas (assume 1020 Btu/scf at 60°F).

[e] Based on 100% conversion of fuel sulfur to SO_2. Assumes sulfur content in natural gas of 2,000 gr/10^6scf.

[f] Emission factor for TOC is based on measured emission levels from 22 source tests.

[g] Emission factor for methane is determined by subtracting the VOC and ethane emission factors from the TOC emission factor. Measured emission factor for methane compares well with the calculated emission factor, 1.31 lb/MMBtu vs. 1.25 lb/MMBtu, respectively.

[h] VOC emission factor is based on the sum of the emission factors for all speciated organic compounds less ethane and methane.

[i] Considered ≤ 1 μm in aerodynamic diameter. Therefore, for filterable PM emissions, PM10(filterable) = PM2.5(filterable).

[j] PM Condensable = PM Condensable Inorganic + PM-Condensable Organic

[k] Hazardous Air Pollutant as defined by Section 112(b) of the Clean Air Act.

[l] For lean burn engines, aldehyde emissions quantification using CARB 430 may reflect interference with the sampling compounds due to the nitrogen concentration in the stack. The presented emission factor is based on FTIR measurements. Emissions data based on CARB 430 are available in the background report.

TABLE 1.4-2. EMISSION FACTORS FOR CRITERIA POLLUTANTS AND GREENHOUSE GASES FROM NATURAL GAS COMBUSTION[a]

Pollutant	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
CO_2[b]	120,000	A
Lead	0.0005	D
N_2O (Uncontrolled)	2.2	E
N_2O (Controlled-low-NO_X burner)	0.64	E
PM (Total)[c]	7.6	D
PM (Condensable)[c]	5.7	D
PM (Filterable)[c]	1.9	B
SO_2[d]	0.6	A
TOC	11	B
Methane	2.3	B
VOC	5.5	C

[a] Reference 11. Units are in pounds of pollutant per million standard cubic feet of natural gas fired. Data are for all natural gas combustion sources. To convert from $lb/10^6$ scf to $kg/10^6$ m^3, multiply by 16. To convert from $lb/10^6$ scf to lb/MMBtu, divide by 1,020. The emission factors in this table may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to this average heating value. TOC = Total Organic Compounds. VOC = Volatile Organic Compounds.

[b] Based on approximately 100% conversion of fuel carbon to CO_2. $CO_2[lb/10^6 scf] = (3.67)(CON)(C)(D)$, where CON = fractional conversion of fuel carbon to CO_2, C = carbon content of fuel by weight (0.76), and D = density of fuel, $4.2x10^4$ $lb/10^6$ scf.

[c] All PM (total, condensible, and filterable) is assumed to be less than 1.0 micrometer in diameter. Therefore, the PM emission factors presented here may be used to estimate PM_{10}, $PM_{2.5}$ or PM_1 emissions. Total PM is the sum of the filterable PM and condensible PM. Condensible PM is the particulate matter collected using EPA Method 202 (or equivalent). Filterable PM is the particulate matter collected on, or prior to, the filter of an EPA Method 5 (or equivalent) sampling train.

[d] Based on 100% conversion of fuel sulfur to SO_2. Assumes sulfur content is natural gas of 2,000 grains/10^6 scf. The SO_2 emission factor in this table can be converted to other natural gas sulfur contents by multiplying the SO_2 emission factor by the ratio of the site-specific sulfur content (grains/10^6 scf) to 2,000 grains/10^6 scf.

TABLE 1.4-3. EMISSION FACTORS FOR SPECIATED ORGANIC COMPOUNDS FROM NATURAL GAS COMBUSTION[a]

CAS No.	Pollutant	Emission Factor (lb/10^6 scf)	Emission Factor Rating
91-57-6	2-Methylnaphthalene[b, c]	2.4E-05	D
56-49-5	3-Methylchloranthrene[b, c]	<1.8E-06	E
	7,12-Dimethylbenz(a)anthracene[b,c]	<1.6E-05	E
83-32-9	Acenaphthene[b,c]	<1.8E-06	E
203-96-8	Acenaphthylene[b,c]	<1.8E-06	E
120-12-7	Anthracene[b,c]	<2.4E-06	E
56-55-3	Benz(a)anthracene[b,c]	<1.8E-06	E
71-43-2	Benzene[b]	2.1E-03	B
50-32-8	Benzo(a)pyrene[b,c]	<1.2E-06	E
205-99-2	Benzo(b)fluoranthene[b,c]	<1.8E-06	E
191-24-2	Benzo(g,h,i)perylene[b,c]	<1.2E-06	E
205-82-3	Benzo(k)fluoranthene[b,c]	<1.8E-06	E
106-97-8	Butane	2.1E+00	E
218-01-9	Chrysene[b,c]	<1.8E-06	E
53-70-3	Dibenzo(a,h)anthracene[b,c]	<1.2E-06	E
25321-22-6	Dichlorobenzene[b]	1.2E-03	E
74-84-0	Ethane	3.1E+00	E
206-44-0	Fluoranthene[b,c]	3.0E-06	E
86-73-7	Fluorene[b,c]	2.8E-06	E
50-00-0	Formaldehyde[b]	7.5E-02	B
110-54-3	Hexane[b]	1.8E+00	E
193-39-5	Indeno(1,2,3-cd)pyrene[b,c]	<1.8E-06	E
91-20-3	Naphthalene[b]	6.1E-04	E
109-66-0	Pentane	2.6E+00	E
85-01-8	Phenanathrene[b,c]	1.7E-05	D

TABLE 1.4-3. EMISSION FACTORS FOR SPECIATED ORGANIC COMPOUNDS FROM NATURAL GAS COMBUSTION (Continued)

CAS No.	Pollutant	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
74-98-6	Propane	1.6E+00	E
129-00-0	Pyrene[b, c]	5.0E-06	E
108-88-3	Toluene[b]	3.4E-03	C

[a] Reference 11. Units are in pounds of pollutant per million standard cubic feet of natural gas fired. Data are for all natural gas combustion sources. To convert from $lb/10^6$ scf to $kg/10^6$ m^3, multiply by 16. To convert from $lb/10^6$ scf to lb/MMBtu, divide by 1,020. Emission Factors preceeded with a less-than symbol are based on method detection limits.

[b] Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act.

[c] HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.

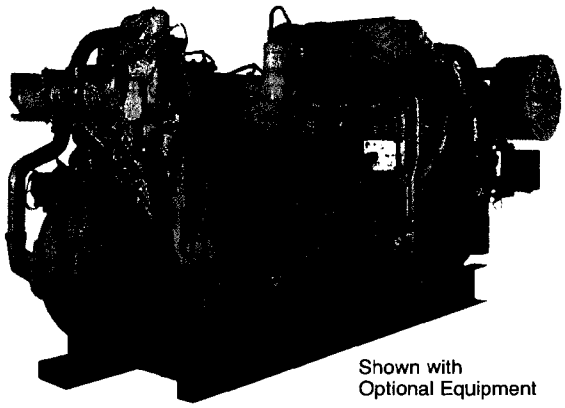
[d] The sum of individual organic compounds may exceed the VOC and TOC emission factors due to differences in test methods and the availability of test data for each pollutant.

CATERPILLAR®

G3516 LE Gas Petroleum Engine

858-999 bkW
1150-1340 bhp
1200-1400 rpm

2.0 g/bhp-hr NOx (NTE)



Shown with Optional Equipment

CAT® ENGINE SPECIFICATIONS

V-16, 4-Stroke-Cycle

Bore	170 mm (6.7 in.)
Stroke	190 mm (7.5 in.)
Displacement	69 L (4210 cu. in.)
Aspiration	Turbocharged-Aftercooled
Digital Engine Management Governor and Protection	Electronic (ADEM™ A3)
Combustion	Low Emission (Lean Burn)
Engine Weight, net dry (approx)	8015 kg (17,670 lb)
Power Density	8 kg/kW (13.2 lb/bhp)
Power per Displacement	19.3 bhp/L
Total Cooling System Capacity	217.7 L (57.5 gal)
Jacket Water	200.6 L (53 gal)
Aftercooler Circuit	17 L (4.5 gal)
Lube Oil System (refill)	424 L (112 gal)
Oil Change Interval	1000 hours
Rotation (from flywheel end)	Counterclockwise
Flywheel and Flywheel Housing	SAE No. 00
Flywheel Teeth	183

FEATURES

Engine Design
- Proven reliability and durability
- Ability to burn a wide spectrum of gaseous fuels
- Robust diesel strength design prolongs life and lowers owning and operating costs
- Broad operating speed range

Emissions
Meets U.S. EPA Spark Ignited Stationary NSPS Emissions for 2007/8

Lean Burn Engine Technology
Lean-burn engines operate with large amounts of excess air. The excess air absorbs heat during combustion reducing the combustion temperature and pressure, greatly reducing levels of NOx. Lean-burn design also provides longer component life and excellent fuel consumption.

Advanced Digital Engine Management
ADEM A3 control system providing integrated ignition, speed governing, protection, and controls, including detonation-sensitive variable ignition timing. ADEM A3 has improved: user interface, display system, shutdown controls, and system diagnostics.

Ease of Operation
Side covers on block allow for inspection of internal components

Full Range of Attachments
Large variety of factory-installed engine attachments reduces packaging time

Testing
Every engine is full-load tested to ensure proper engine performance.

Gas Engine Rating Pro
GERP is a PC-based program designed to provide site performance capabilities for Cat® natural gas engines for the gas compression industry. GERP provides engine data for your site's altitude, ambient temperature, fuel, engine coolant heat rejection, performance data, installation drawings, spec sheets, and pump curves.

Product Support Offered Through Global Cat Dealer Network
More than 2,200 dealer outlets

Cat factory-trained dealer technicians service every aspect of your petroleum engine

Cat parts and labor warranty

Preventive maintenance agreements available for repair-before-failure options

S•O•S℠ program matches your oil and coolant samples against Caterpillar set standards to determine:
- Internal engine component condition
- Presence of unwanted fluids
- Presence of combustion by-products
- Site-specific oil change interval

Over 80 Years of Engine Manufacturing Experience
Over 60 years of natural gas engine production

Ownership of these manufacturing processes enables Caterpillar to produce high quality, dependable products.
- Cast engine blocks, heads, cylinder liners, and flywheel housings
- Machine critical components
- Assemble complete engine

Web Site
For all your petroleum power requirements, visit www.catoilandgas.cat.com.

STANDARD EQUIPMENT

Air Inlet System
Air cleaner — intermediate-duty with service indicator

Control System
A3 ECU
Air-fuel ratio control

Cooling System
Thermostats and housing
Jacket water pump
Aftercooler water pump
Aftercooler core for sea-air atmosphere
Aftercooler thermostats and housing

Exhaust System
Watercooled exhaust manifolds

Flywheels & Flywheel Housings
SAE No. 00 flywheel
SAE No. 00 flywheel housing
SAE standard rotation

Fuel System
Gas pressure regulator
Natural gas carburetor

Ignition System
A3 ECU

Instrumentation
PL1000 Advisor panel

Lubrication System
Crankcase breather — top mounted
Oil cooler
Oil filter — RH
Oil bypass filter
Oil pan — shallow
Oil sampling valve
Turbo oil accumulator

Mounting System
Rails, engine mounting — 254 mm (10 in)

Protection System
Electronic shutoff system
Gas shutoff valve

General
Paint — Cat yellow
Vibration damper and guard — dual 484 mm (23 in)

OPTIONAL EQUIPMENT

Air Inlet System
Remote air inlet adapters
Precleaner

Charging System
Battery chargers
Charging alternators

Cooling System
Aftercooler core
Thermostatic valve
Temperature switch
Connections
Expansion and overflow tank
Water level switch gauge

Exhaust System
Flexible fittings
Elbows
Flange
Flange and exhaust expanders
Rain cap
Mufflers

Fuel System
Low pressure gas conversions
Propane gas valve and jet kits
Fuel filter

Instrumentation
PL1000 communications modules

Lubrication System
Oil bypass filter removal and oil pan accessories
Sump pump
Air prelube pump
Manual prelube pump
Lubricating oil

Mounting System
Rails
Vibration isolators

Power Take-Offs
Front accessory drives
Auxiliary drive shafts and pulleys
Front stub shaft
Pulleys

Protection System
Explosion relief valves, status control box interconnect wiring harness

Starting System
Air starting motor
Air pressure regulator
Air silencer
Electric air start controls
Electric starting motors — dual 24-volt
Starting aids
Battery sets (24-volt dry), cables, and rack

General
Flywheel intertia weight
Guard removal
Engine barring group
Premium 8:1 pistons
Premium cylinder heads

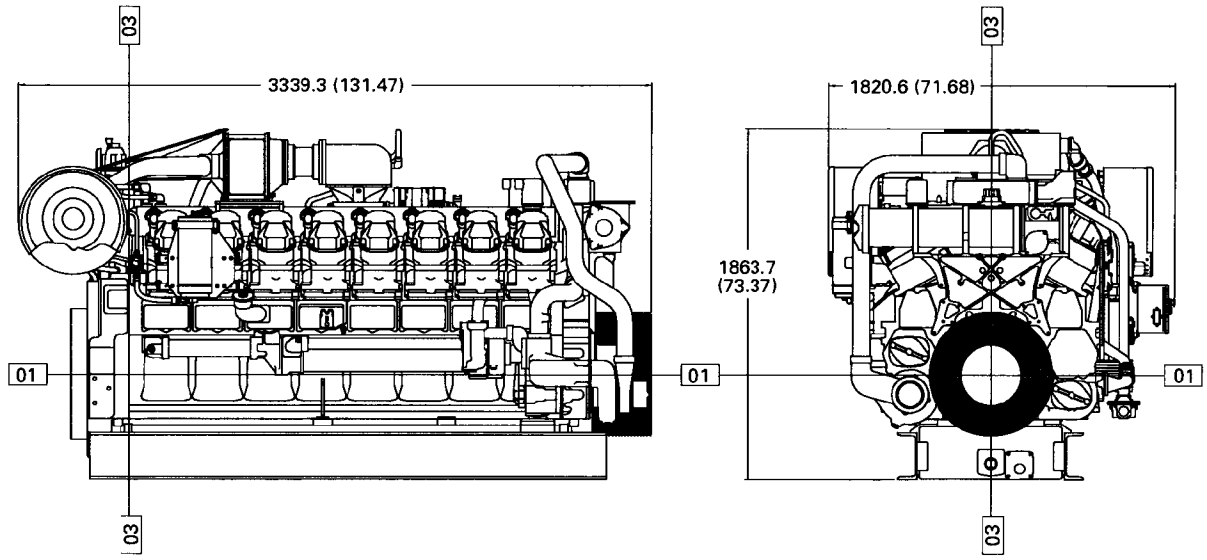
TECHNICAL DATA

G3516 LE Gas Petroleum Engine

Fuel System		2 g NOx NTE Rating DM8618-01	2 g NOx NTE Rating DM8620-01
Engine Power			
@ 100% Load	bkW (bhp)	999 (1340)	858 (1150)
@ 75% Load	bkW (bhp)	749 (1004)	643 (862)
Engine Speed	rpm	**1400**	**1200**
Max Altitude @ Rated Torque and 38°C (100°F)	m (ft)	304.8 (1000)	1219.2 (4000)
Speed Turndown @ Max Altitude, Rated Torque, and 38°C (100°F)	%	25	9.2
SCAC Temperature	°C (°F)	54 (130)	54 (130)
Emissions*			
NOx	g/bkW-hr (g/bhp-hr)	2.68 (2)	2.68 (2)
CO	g/bkW-hr (g/bhp-hr)	2.49 (1.86)	2.35 (1.75)
CO_2	g/bkW-hr (g/bhp-hr)	632 (471)	624 (466)
VOC**	g/bkW-hr (g/bhp-hr)	0.35 (0.26)	0.4 (0.3)
Fuel Consumption***			
@ 100% Load	MJ/bkW-hr (Btu/bhp-hr)	10.48 (7405)	10.36 (7324)
@ 75% Load	MJ/bkW-hr (Btu/bhp-hr)	10.79 (7628)	10.76 (7605)
Heat Balance			
Heat Rejection to Jacket Water			
@ 100% Load	bkW (Btu/mn)	741 (42,123)	639 (36,343)
@ 75% Load	bkW (Btu/mn)	616.7 (35,075)	554 (31,480)
Heat Rejection to Aftercooler			
@ 100% Load	bkW (Btu/mn)	167.8 (9546)	131.9 (7509)
@ 75% Load	bkW (Btu/mn)	108.6 (6179)	72.2 (4108)
Heat Rejection to Exhaust			
@ 100% Load LHV to 25° C (77° F)	bkW (Btu/mn)	837.8 (47,643)	694.6 (39,536)
@ 75% Load LHV to 25° C (77° F)	bkW (Btu/mn)	630.4 (35,848)	524.1 (29,806)
Exhaust System			
Exhaust Gas Flow Rate			
@ 100% Load	m^3/min (cfm)	217.0 (7663)	182.9 (6460)
@ 75% Load	m^3/min (cfm)	163.8 (5785)	138.9 (4905)
Exhaust Stack Temperature			
@ 100% Load	°C (°F)	467.22 (873)	452.2 (846)
@ 75% Load	°C (°F)	467.22 (873)	450.5 (843)
Intake System			
Air Inlet Flow Rate			
@ 100% Load	m^3/min (scfm)	80.6 (2847)	69.5 (2453)
@ 75% Load	m^3/min (scfm)	60.8 (2147)	52.8 (1864)
Gas Pressure	kPag (psig)	241.5-275.8 (35-40)	241.5-275.8 (35-40)

*at 100% load and speed, all values are listed as not to exceed
**Volatile organic compounds as defined in U.S. EPA 40 CFR 60, subpart JJJ
***ISO 3046/1

GAS PETROLEUM ENGINE



DIMENSIONS		
Length	mm (in.)	3339.3 (131.47)
Width	mm (in.)	1820.6 (71.68)
Height	mm (in.)	1863.7 (73.37)
Shipping Weight	kg (lb)	8015 (17,670)

Note: General configuration not to be used for installation. See general dimension drawings for detail (drawing #289-2971).

Dimensions are in mm (inches).

RATING DEFINITIONS AND CONDITIONS

Engine performance is obtained in accordance with SAE J1995, ISO3046/1, BS5514/1, and DIN6271/1 standards.

Transient response data is acquired from an engine/ generator combination at normal operating temperature and in accordance with ISO3046/1 standard ambient conditions. Also in accordance with SAE J1995, BS5514/1, and DIN6271/1 standard reference conditions.

Conditions: Power for gas engines is based on fuel having an LHV of 33.74 kJ/L (905 Btu/cu ft) at 101 kPa (29.91 in. Hg) and 15° C (59° F). Fuel rate is based on a cubic meter at 100 kPa (29.61 in. Hg) and 15.6° C (60.1° F). Air flow is based on a cubic foot at 100 kPa (29.61 in. Hg) and 25° C (77° F). Exhaust flow is based on a cubic foot at 100 kPa (29.61 in. Hg) and stack temperature.

Performance Numbers: DM8618-01, DM8620-01
LEHW0036-00 (11-09)
Supersedes LEHW6046-02

Mailing address: **P.O. Box 90, Canada, Ontario, Canada, L4K 1B2**
Toll free: **1-800-872-1968** *Phone:* **905-660-6450** *Fax:* **905-660-6435** *E-mail:* **info@dcl-inc.com**
DCL International Inc.

To	Barry Loyd
	ISC
Date	December 15, 2010

Telephone	
Facsimile	
Email	
No.of Pages	

RE: EMISSIONS GUARANTEE FOR CSI

Freddy,

We hereby guarantee that our QUICK-LID™ Model DC65Q-12 catalytic converter described below:

Catalyst model	DC65
Catalyst coating	Oxidation (Q)
Outside Diameter of catalyst substrate	30.75"
No. of catalyst substrates	1
Cell Density	300 cpsi

and sized for the following engine:

Engine model	CAT 3516 TALE
Power	1340 hp @ 1400 rpm
Fuel	Pipeline Quality Natural Gas

will perform as follows:

Emissions	**After Catalyst**
Carbon Monoxide (CO)	93 % reduction
Volatile Organic Compounds (VOCs)	45 % reduction
Formaldehyde (CH2O)	90 % reduction

for a period of 1 year or 8000 hours, whichever comes first, subject to all terms and conditions contained in the attached warranty document being respected and met.

Best regards,
DCL International, Inc.

Tawnya VanGroningen

Tawnya VanGroningen
Account Manager
North American Industrial Catalyst Division

Quote#16-1448

SITE DATA

OIL & GAS STANDARD PERMIT REGISTRATION

DEWITT CENTRAL FACILITY 3

BURLINGTON RESOURCES OIL & GAS COMPANY LP

Representative Analyses:
Karnes 1 CF
and Laird B1

Stream Compositions:

	Stream 1		Stream 2		Stream 3		Stream 4	
	Inlet Gas		Flare Assist Gas		LP Condensate		Produced Water	
Component	mole %	wgt. %	mole %	wgt. %	mole %	wgt. %	mole %	wgt %
Nitrogen	0.066%	0.073%	0.164%	0.202%	0.019%	0.006%	0.000%	0.000%
Carbon Dioxide	1.547%	2.686%	2.163%	4.181%	0.091%	0.044%	0.001%	0.002%
Water	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	99.000%	95.175%
Hydrogen Sulfide	0.050%	0.067%	0.050%	0.075%	0.000%	0.000%	0.000%	0.000%
Methane	68.416%	43.310%	75.685%	53.335%	1.955%	0.347%	0.020%	0.017%
Ethane	13.711%	16.268%	11.765%	15.540%	1.870%	0.623%	0.019%	0.030%
Propane	6.933%	12.063%	4.689%	9.082%	3.295%	1.610%	0.033%	0.078%
I-Butane	1.713%	3.929%	0.899%	2.295%	1.994%	1.284%	0.020%	0.062%
N-Butane	2.913%	6.681%	1.663%	4.246%	5.092%	3.279%	0.051%	0.158%
I-Pentane	1.301%	3.704%	0.652%	2.066%	6.039%	4.827%	0.060%	0.231%
N-Pentane	1.150%	3.274%	0.623%	1.974%	7.432%	5.940%	0.074%	0.285%
Cyclopentane	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
n-Hexane	0.492%	1.673%	0.279%	1.056%	8.487%	8.102%	0.085%	0.391%
Cyclohexane	0.177%	0.602%	0.137%	0.519%	1.770%	1.690%	0.018%	0.083%
Other Hexanes	0.995%	3.383%	0.517%	1.957%	10.022%	9.567%	0.100%	0.460%
Heptanes	0.350%	1.384%	0.347%	1.527%	22.420%	24.886%	0.224%	1.198%
Octanes	0.048%	0.216%	0.109%	0.547%	11.860%	15.007%	0.119%	0.725%
Nonanes	0.016%	0.081%	0.058%	0.327%	4.456%	6.331%	0.045%	0.308%
Decanes Plus	0.000%	0.000%	0.014%	0.087%	4.474%	7.052%	0.045%	0.342%
Benzene	0.057%	0.175%	0.034%	0.116%	0.754%	0.652%	0.008%	0.033%
Toluene	0.094%	0.342%	0.132%	0.534%	4.004%	4.087%	0.040%	0.197%
Ethylbenzene	0.002%	0.008%	0.006%	0.028%	0.699%	0.822%	0.007%	0.040%
Xylene	0.019%	0.080%	0.065%	0.303%	3.268%	3.844%	0.033%	0.187%
Totals	100.05%	100.00%	100.05%	100.00%	100.001%	100.00%	100.002%	100.00%
Totals (C3+)		37.60%		26.66%		98.98%		4.78%
VOC max (%)		40.00%		30.00%		100.00%		10.00%
Benzene Max (%)		0.26%		0.17%		0.98%		0.05%
Higher Heating Value (Btu/scf)	1473		1315					
Lower Heating Value (Btu/scf)	1448		1292					
Specific Gravity	0.8781				0.6955			

NOTE: the Gas Analyses used for the Site as a representative analysis was chosen because of its proximity, shale location, and production characteristics. Due to these similiarities it is anticipated the samples will be representative to the Site. Because these sites are still being constructed and wells have yet to be drilled, Burlington Resources is using the best available representative data in that area at this time. Burlington is pro-actively sampling sites in that area and each application reflects the most representative sample available. Additionally, H_2S representations are also from nearby representative data, as shown in Figure 6-1. Please note that this is in an effort to comply with the TCEQ guidance on representative samples in the most conservative manner possible. This approach has been discussed and previously approved with multiple TCEQ reviewers.

SGS LABORATORY REFERENCE NUMBER : **6891-250891**

Conoco Phillips

ID:	**Karnes CF 1**	LINE PRESSURE:	**42 PSI**
AREA:	**Eagleford**	LINE TEMPERATURE:	**73 F**
METER:	**Low Pressure Separator**	CYLINDER NUMBER:	**0081**
LEASE:		EFFECTIVE DATE:	
OPERATOR:		SAMPLED BY:	**Robert Hester**
STATION:		ANALYZED BY:	**Kerry Quave**
SAMPLE DATE:	**12/20/2011**	ANALYZED DATE:	**12/24/2011**
SAMPLE OF:	**Gas**	SAMPLE TYPE:	**Spot**

Physical Properties per GPA 2145-09 — Calculations per GPA 2286-03

Note: Zero = Less than detection limit

	MOL%	WEIGHT%	GPM @ 14.696
NITROGEN	0.066	0.073	
CARBON DIOXIDE	1.547	2.689	
METHANE	68.416	43.355	
ETHANE	13.711	16.285	3.676
PROPANE	6.933	12.076	1.915
ISOBUTANE	1.713	3.933	0.562
N-BUTANE	2.913	6.688	0.921
ISOPENTANE	1.301	3.708	0.477
N-PENTANE	1.150	3.277	0.418
HEXANES	1.401	4.768	0.579
HEPTANES PLUS	0.849	3.148	0.332
	100.000	100.000	8.880

BTU	**Vol. IDEAL Gas Fuel**	**Vol. Real Gas Fuel**
BTU @ 14.696 PSIA (DRY)	1465.7	1473.1
BTU @ 14.696 PSIA (SAT.)	1440.2	1448.0
Specific Gravity	0.8741	0.8781
Compressibility (Z)	0.9950	

Gasoline Content (Gallons Per Thousand - GPM)

Ethane & Heavier	8.548
Propane & Heavier	4.872
Butane & Heavier	2.957
Pentane & Heavier	1.474
Total 26 psi Reid V.P. Gasoline GPM	2.695

Secondary BTU Psia Base	**Vol. IDEAL Gas Fuel**	**Vol. Real Gas Fuel**
BTU @ 15.025 PSIA (DRY)	1498.6	1506.2
BTU @ 15.025 PSIA (SAT.)	1472.4	1480.6
Compressibility (Z) at 15.025 =	0.9949	

Remarks:
Remarks:

Precision parameters apply in the determination of above test results. Also refer to ASTM D 3244-97/02, IP 367/96 and appendix E of IP standard methods for analysis and testing for utilization of test data to determine conformance with specifications.

SGS LABORATORY REFERENCE NUMBER : **6891-250891**

COMPANY: Conoco Phillips **SAMPLE DATE: ########**
AREA / FIELD: Eagleford
LEASE:

	MOL%	WEIGHT%	GPM @ 14.696
NITROGEN	0.066	0.073	0.007
CARBON DIOXIDE	1.547	2.689	0.265
METHANE	68.416	43.355	11.627
ETHANE	13.711	16.285	3.676
PROPANE	6.933	12.076	1.915
ISOBUTANE	1.713	3.933	0.562
N-BUTANE	2.913	6.688	0.921
ISOPENTANE	1.301	3.708	0.477
N-PENTANE	1.150	3.277	0.418
2,2-Dimethylbutane	0.072	0.244	0.030
2,3-Dimethylbutane & Cyclopentane	0.000	0.000	0.000
2-Methylpentane	0.516	1.756	0.215
3-Methylpentane	0.321	1.093	0.131
n-Hexane	0.492	1.675	0.203
2,2-Dimethylpentane	0.016	0.063	0.008
Methylcyclopentane	0.086	0.286	0.030
2,4-Dimethylpentane	0.002	0.008	0.001
2,2,3- Trimethylbutane	0.000	0.000	0.000
Benzene	0.057	0.176	0.016
3,3-Dimethylpentane	0.000	0.000	0.000
Cyclohexane	0.177	0.588	0.060
2-Methylhexane	0.014	0.055	0.007
2,3-Dimethylpentane	0.087	0.344	0.040
1,1-Dimethylcyclopentane	0.000	0.000	0.000
3-Methylhexane	0.011	0.044	0.005
l,t-3-Dimethylcyclopentane	0.006	0.023	0.002
1,c-3-Dimethylcyclopentane & 3-Ethylpentane	0.009	0.035	0.004
l,t-2-Dimethylcyclopentane & 2,2,4- Trimethylpentane	0.000	0.000	0.000
n-Heptane	0.122	0.483	0.056
Methylcyclohexane	0.082	0.318	0.033
1,1,3- Trimethylcyclopentane & 2,2-Dimethylhexane	0.003	0.013	0.001
2,5-Dimethylhexane & 2,4-Dimethylhexane	0.000	0.000	0.000
Ethylcyclopentane	0.001	0.004	0.000
2,2,3- Trimethylpentane & 1,t-2,c-4- Trimethylcyclopentane	0.000	0.000	0.000
3,3-Dimethylhexane & 1,t-2,c-3- Trimethylcyclopentane	0.000	0.000	0.000
2,3,4- Trimethylpentane & 2,3.Dimethylhexane	0.000	0.000	0.000
Toluene	0.094	0.342	0.032
1,1,2- Trimethylcyclopentane	0.000	0.000	0.000
3,4-Dimethylhexane	0.000	0.000	0.000
2-Methylheptane	0.018	0.081	0.009
4-Methylheptane	0.000	0.000	0.000
1,c-2,t-4- Trimethylcyclopentane	0.000	0.000	0.000
3-Methylheptane & 3,4-Dimethylhexane	0.002	0.009	0.001

Precision parameters apply in the determination of above test results. Also refer to ASTM D 3244-97/02, IP 367/96 and appendix E of IP standard methods for analysis and testing for utilization of test data to determine conformance with specifications.

SGS LABORATORY REFERENCE NUMBER : **6891-250891**

COMPANY: Conoco Phillips **SAMPLE DATE: ########**
AREA / FIELD: Eagleford
LEASE:

	MOL%	WEIGHT%	GPM @ 14.696
1,c-3-Dimethylcyclohexane & 3-Ethylhexane	0.000	0.000	0.000
l,t-4-Dimethylcyclohexane & 1,c2,t3- Trimethylcyclopentane	0.000	0.000	0.000
2,2,5-Trimethylhexane & 1,1-Dimethylcyclohexane	0.000	0.000	0.000
Methyl-Ethylcyclopentane's & 2,2,4- Trimethylhexane	0.008	0.036	0.004
n-Octane	0.022	0.099	0.011
1,t2 Dimethylcyclohexane & 2,2,4,4- Tetramethylpentane	0.000	0.000	0.000
1,t-3-Dimethylcyclohexane & 1,c-4-Dimethylcyclohexane	0.001	0.004	0.000
Dimethylheptanes & 1 ,c-2,c-3- Trimethylcyclopentane	0.001	0.005	0.000
Isopropylcyclopentane	0.001	0.004	0.000
Dimethylheptanes & Trimethylhexanes	0.002	0.010	0.001
1,c-2-Dimethylcyclohexane	0.000	0.000	0.000
Dimethylheptanes	0.002	0.010	0.001
Ethylcyclohexane	0.000	0.000	0.000
n-Propylcyclopentane	0.000	0.000	0.000
Trimethylcyclohexanes	0.000	0.000	0.000
Ethylbenzene	0.002	0.008	0.001
Dimethylheptanes & Trimethylhexanes	0.000	0.000	0.000
m-Xylene & p-Xylene	0.005	0.021	0.002
2 & 4 Methyloctane & 3,4-Dimethylheptane	0.000	0.000	0.000
Trimethylcyclohexanes	0.000	0.000	0.000
3-Methyloctane	0.000	0.000	0.000
Trimethylcyclohexanes	0.000	0.000	0.000
o-Xylene	0.014	0.059	0.005
Trimethylcyclohexanes & Isobutylcyclopentane	0.000	0.000	0.000
n-Nonane	0.004	0.020	0.002
C9 Naphthenes & C10 Paraffins & Trimethylcyclohexanes	0.000	0.000	0.000
Isopropylbenzene & Trimethylcyclohexanes	0.000	0.000	0.000
C9 Naphthenes & C10 Paraffins	0.000	0.000	0.000
Isopropylcyclohexane	0.000	0.000	0.000
C9 Naphthenes & C10 Paraffins & Cyclooctane	0.000	0.000	0.000
N-Propylcyclohexane	0.000	0.000	0.000
C9 Naphthenes & C10 Paraffins & n-Butylcyclopentane	0.000	0.000	0.000
n-Propylbenzene	0.000	0.000	0.000
C9 Naphthenes & C10 Paraffins & EthylBenzenes	0.000	0.000	0.000
m-Ethyltoluene	0.000	0.000	0.000
p-Ethyltoluene	0.000	0.000	0.000
1,3,5- Trimethylbenzene & 4 & 5 Methylnonane	0.000	0.000	0.000
2-Methylnonane & 3-Ethyloctane	0.000	0.000	0.000
C9 Naphthenes & C10 Paraffins	0.000	0.000	0.000
O-Ethyltoluene & 3-Methylnonane	0.000	0.000	0.000
C9 Naphthenes & C10 Paraffins	0.000	0.000	0.000
tert-Butylbenzene	0.000	0.000	0.000
1,2,4 Trimethylbenzene & Methylcyclooctane	0.000	0.000	0.000
Isobutylcyclohexane & tert- Butylcyclohexane	0.000	0.000	0.000
n-Decane Plus	0.000	0.000	0.000
	100.000	100.000	20.779

Precision parameters apply in the determination of above test results. Also refer to ASTM D 3244-97/02, IP 367/96 and appendix E of IP standard methods for analysis and testing for utilization of test data to determine conformance with specifications.

SGS LABORATORY REFERENCE NUMBER : **6891-250891**

COMPANY: Conoco Phillips **SAMPLE DATE: ########**
AREA / FIELD: Eagleford
LEASE:

Calculated Value	Total Sample	Heptanes Plus
Molecular Weight	25.317	93.928
Relative Density	0.3871	0.7572
Liquid Density (lbs/gal Absolute Density)	3.227	6.313
Liquid Density (lbs/gal Weight In Air)	3.224	6.307
Cu.Ft./Vapor / Gal. @ 14.696	48.370	25.505
Vapor Pressure @ 100° F	3546.880	0.870
API Gravity at 60° F	234.0	55.4
BTU / LB	21971	7990
BTU / GAL.	70890	46512
BTU / Cu. FT. (Vol. IDEAL Gas Fuel @ 14.696)	1465.7	4973.3
Specific Gravity as a Vapor @ 14.696	0.8741	1.2239

Heavy End Grouping Breakdown

HEXANES	C6	1.401
HEPTANES	C7	0.587
OCTANES	C8	0.230
NONANES	C9	0.032
DECANES+	C10	0.000
	Total	2.250 **Mol%**

BTEX BREAKDOWN

	Mol%	WT.%
BENZENE	0.057	0.176
TOLUENE	0.094	0.342
ETHYLBENZENE	0.002	0.008
XYLENES	0.019	0.080
Total BTEX	**0.172**	**0.606**

Precision parameters apply in the determination of above test results. Also refer to ASTM D 3244-97/02, IP 367/96 and appendix E of IP standard methods for analysis and testing for utilization of test data to determine conformance with specifications.

SGS LABORATORY REFERENCE NUMBER : **6891-250891**

Conoco Phillips

ID:	**Karnes CF 1**	LINE PRESSURE:	**42 PSI**
AREA:	**Eagleford**	LINE TEMPERATURE:	**73 F**
METER:	**Low Pressure Separator**	CYLINDER NUMBER:	**0081**
LEASE:		EFFECTIVE DATE:	
OPERATOR:		SAMPLED BY:	**Robert Hester**
STATION:		ANALYZED BY:	**Kerry Quave**
SAMPLE DATE:	**12/20/2011**	ANALYZED DATE:	**12/24/2011**
SAMPLE OF:	**Gas**	SAMPLE TYPE:	**Spot**

Physical Properties per GPA 2145-09 — Calculations per GPA 2286-03

Note: Zero = Less than detection limit

	MOL%	WEIGHT%	GPM @ 14.696
NITROGEN	0.066	0.073	
CARBON DIOXIDE	1.547	2.689	
METHANE	68.416	43.355	
ETHANE	13.711	16.285	3.676
PROPANE	6.933	12.076	1.915
ISOBUTANE	1.713	3.933	0.562
N-BUTANE	2.913	6.688	0.921
ISOPENTANE	1.301	3.708	0.477
N-PENTANE	1.150	3.277	0.418
HEXANE	1.401	4.768	0.579
HEPTANE	0.587	2.105	0.229
OCTANE	0.230	0.902	0.091
NONANE	0.032	0.141	0.012
DECANE+	0.000	0.000	0.000
	100.000	100.000	8.880

BTU	**Vol. IDEAL Gas Fuel**	**Vol. Real Gas Fuel**
BTU @ 14.696 PSIA (DRY)	1465.7	1473.1
BTU @ 14.696 PSIA (SAT.)	1440.2	1448.0
Specific Gravity	0.8741	0.8781
Compressibility (Z)	0.9950	

Gasoline Content (Gallons Per Thousand - GPM)

Ethane & Heavier	8.548
Propane & Heavier	4.872
Butane & Heavier	2.957
Pentane & Heavier	1.474
Total 26 psi Reid V.P. Gasoline GPM	2.695

Secondary BTU Psia Base	**Vol. IDEAL Gas Fuel**	**Vol. Real Gas Fuel**
BTU @ 15.025 PSIA (DRY)	1498.6	1506.2
BTU @ 15.025 PSIA (SAT.)	1472.4	1480.6

Compressibility (Z) at 15.025 = 0.9949

Remarks:

Precision parameters apply to the determination of above test results. Also refer to ASTM D 3244-97/02, IP 367/96 and appendix E of IP standard methods for analysis and testing for utilization of test data to determine conformance with specifications.

Remarks:

SGS LABORATORY

COMPANY: Conoco Phillips
AREA / FIELD: Eagleford

Sample Container	Sample Description	Sample Point	Sample Time	Matrix	PVP by D 5191	Sample Pressure, psi	Sample Temp, F
Cylinder Type/No.or Bottle	Field/Locations.Well		Date, hours				
Station No. 74141 (19)	Karnes CF1	LP Separator before Dump Valve	12-20-2011 @ 3:00 PM	Condensate	**14.45 psi**	50	70

Chromatographic Extended Analysis - Summation Report

Component	Mol%	Liq Vol%	Wt%
Nitrogen	0.019	0.005	0.006
Carbon Dioxide	0.091	0.038	0.045
Methane	1.955	0.809	0.349
Ethane	1.870	1.221	0.625
Propane	3.295	2.216	1.616
Isobutane	1.994	1.593	1.289
N-Butane	5.092	3.919	3.292
2,2 Dimethylpropane	0.043	0.040	0.034
IsoPentane	6.039	5.392	4.846
n-Pentane	7.389	6.539	5.929
2,2 Dimethylbutane	0.304	0.310	0.292
Cyclopentane	0.000	0.000	0.000
2,3 Dimethylbutane	0.583	0.583	0.559
2 Methylpentane	4.786	4.850	4.588
3 Methylpentane	3.081	3.071	2.953
n-Hexane	8.487	8.521	8.135
Heptanes Plus	54.974	60.893	65.443
Total	100.000	100.000	100.000

Characteristics of Heptanes Plus

Specific Gravity	0.7475	(Water = 1)
API Gravity	57.79	@60 F
Molecular Weight	107.0	
Vapor Volume	22.17	CF/Gal
Weight	6.23	Lbs/Gal

Characteristics of Total Sample

Specific Gravity	0.6955	(Water = 1)
API Gravity	71.94	@60 F
Molecular Weight	89.9	
Vapor Volume	24.56	CF/Gal
Weight	5.80	Lbs/Gal

Total Extended Report

Component	Mol%	Liq Vol%	Wt%
Nitrogen	0.019	0.005	0.006
Carbon Dioxide	0.091	0.038	0.045
Methane	1.955	0.809	0.349
Ethane	1.870	1.221	0.625
Propane	3.295	2.216	1.616
Isobutane	1.994	1.593	1.289
N-Butane	5.092	3.919	3.292
2,2 Dimethylpropane	0.043	0.040	0.034
IsoPentane	6.039	5.392	4.846
n-Pentane	7.389	6.539	5.929
2,2 Dimethylbutane	0.304	0.310	0.292
Cyclopentane	0.000	0.000	0.000
2,3 Dimethylbutane	0.583	0.583	0.559
2 Methylpentane	4.786	4.850	4.588
3 Methylpentane	3.081	3.071	2.953
n-Hexane	8.487	8.521	8.135
Methylcyclopentane	1.268	1.095	1.187
Benzene	0.754	0.515	0.655
Cyclohexane	1.770	1.471	1.657
2-Methylhexane	4.721	5.359	5.262
3-Methylhexane	3.728	4.178	4.155
2,2,4 Trimethylpentane	0.000	0.000	0.000
Other C-7's	2.687	2.854	2.965
n-Heptane	7.305	8.228	8.141
Methylcyclohexane	3.979	3.905	4.345
Toluene	4.004	3.274	4.104
Other C-8's	8.380	9.582	10.273
n-Octane	3.480	4.353	4.422
E-Benzene	0.699	0.658	0.825
M & P Xylenes	2.613	2.476	3.086
O-Xylene	0.655	0.608	0.774
Other C-9's	3.032	3.872	4.257
n-Nonane	1.424	1.956	2.031
Other C-10's	2.258	3.169	3.548
n-Decane	0.540	0.809	0.854
Undecanes (11)	1.106	1.593	1.809
Dodecanes (12)	0.383	0.597	0.687
Tridecanes (13)	0.115	0.192	0.224
Tetradecanes (14)	0.031	0.055	0.065
Pentadecanes (15)	0.014	0.027	0.032
Hexadecanes (16)	0.007	0.013	0.016
Heptadecanes (17)	0.005	0.010	0.012
Octadecanes (18)	0.003	0.006	0.008
Nonadecanes (19)	0.003	0.007	0.008
Eicosanes (20)	0.002	0.005	0.006
Heneicosanes (21)	0.002	0.005	0.006
Docosanes (22)	0.001	0.004	0.005
Tricosanes (23)	0.001	0.004	0.005
Tetracosanes (24)	0.001	0.003	0.004
Pentacosanes (25)	0.001	0.002	0.003
Hexacosanes (26)	0.001	0.002	0.002
Heptacosanes (27)	0.000	0.001	0.002
Octacosanes (28)	0.000	0.001	0.002
Nonacosanes (29)	0.000	0.000	0.001
Triacontanes (30)	0.000	0.001	0.001
Hentriacontanes Plus (31+)	0.000	0.002	0.002
Total	100.000	100.000	100.000

SGS LABORATORY REFERENCE NUMBER : **6894-250891**

Conoco Phillips

ID:	**Laird B1**	LINE PRESSURE:	**1060 PSI**
AREA:	**Eagleford**	LINE TEMPERATURE:	**112 F**
METER:	**High Pressure Separator**	CYLINDER NUMBER:	**0110**
LEASE:		EFFECTIVE DATE:	
OPERATOR:		SAMPLED BY:	**Robert Hester**
STATION:		ANALYZED BY:	**Kerry Quave**
SAMPLE DATE:	**12/20/2011**	ANALYZED DATE:	**12/24/2011**
SAMPLE OF:	**Gas**	SAMPLE TYPE:	**Spot**

Physical Properties per GPA 2145-09 — Calculations per GPA 2286-03

Note: Zero = Less than detection limit

	MOL%	WEIGHT%	GPM @ 14.696
NITROGEN	0.164	0.202	
CARBON DIOXIDE	2.163	4.187	
METHANE	75.685	53.403	
ETHANE	11.765	15.559	3.151
PROPANE	4.689	9.094	1.294
ISOBUTANE	0.899	2.298	0.295
N-BUTANE	1.663	4.251	0.525
ISOPENTANE	0.652	2.069	0.239
N-PENTANE	0.623	1.977	0.226
HEXANES	0.733	2.778	0.302
HEPTANES PLUS	0.964	4.182	0.396
	100.000	100.000	6.428

BTU	**Vol. IDEAL Gas Fuel**	**Vol. Real Gas Fuel**
BTU @ 14.696 PSIA (DRY)	1310.2	1315.3
BTU @ 14.696 PSIA (SAT.)	1287.3	1292.9
Specific Gravity	0.7850	0.7878
Compressibility (Z)	0.9961	

Gasoline Content (Gallons Per Thousand - GPM)

Ethane & Heavier	6.032
Propane & Heavier	2.881
Butane & Heavier	1.587
Pentane & Heavier	0.767
Total 26 psi Reid V.P. Gasoline GPM	1.791

Secondary BTU Psia Base	**Vol. IDEAL Gas Fuel**	**Vol. Real Gas Fuel**
BTU @ 15.025 PSIA (DRY)	1339.5	1344.8
BTU @ 15.025 PSIA (SAT.)	1316.1	1321.9
Compressibility (Z) at 15.025 =	0.9960	

Remarks:
Remarks:

Precision parameters apply in the determination of above test results. Also refer to ASTM D 3244-97/02, IP 367/96 and appendix E of IP standard methods for analysis and testing for utilization of test data to determine conformance with specifications.

SGS LABORATORY REFERENCE NUMBER : **6894-250891**

COMPANY: Conoco Phillips **SAMPLE DATE: ########**
AREA / FIELD: Eagleford
LEASE:

	MOL%	WEIGHT%	GPM @ 14.696
NITROGEN	0.164	0.202	0.018
CARBON DIOXIDE	2.163	4.187	0.370
METHANE	75.685	53.403	12.848
ETHANE	11.765	15.559	3.151
PROPANE	4.689	9.094	1.294
ISOBUTANE	0.899	2.298	0.295
N-BUTANE	1.663	4.251	0.525
ISOPENTANE	0.652	2.069	0.239
N-PENTANE	0.623	1.977	0.226
2,2-Dimethylbutane	0.025	0.093	0.010
2,3-Dimethylbutane & Cyclopentane	0.000	0.000	0.000
2-Methylpentane	0.248	0.940	0.103
3-Methylpentane	0.182	0.688	0.074
n-Hexane	0.279	1.057	0.115
2,2-Dimethylpentane	0.009	0.040	0.004
Methylcyclopentane	0.062	0.229	0.022
2,4-Dimethylpentane	0.001	0.004	0.000
2,2,3- Trimethylbutane	0.000	0.000	0.000
Benzene	0.034	0.117	0.010
3,3-Dimethylpentane	0.000	0.000	0.000
Cyclohexane	0.137	0.507	0.047
2-Methylhexane	0.012	0.053	0.006
2,3-Dimethylpentane	0.071	0.313	0.032
1,1-Dimethylcyclopentane	0.000	0.000	0.000
3-Methylhexane	0.010	0.044	0.005
l,t-3-Dimethylcyclopentane	0.006	0.026	0.002
1,c-3-Dimethylcyclopentane & 3-Ethylpentane	0.009	0.039	0.004
l,t-2-Dimethylcyclopentane & 2,2,4- Trimethylpentane	0.000	0.000	0.000
n-Heptane	0.135	0.595	0.062
Methylcyclohexane	0.092	0.397	0.037
1,1,3- Trimethylcyclopentane & 2,2-Dimethylhexane	0.003	0.015	0.001
2,5-Dimethylhexane & 2,4-Dimethylhexane	0.005	0.025	0.003
Ethylcyclopentane	0.002	0.009	0.001
2,2,3- Trimethylpentane & 1,t-2,c-4- Trimethylcyclopentane	0.000	0.000	0.000
3,3-Dimethylhexane & 1,t-2,c-3- Trimethylcyclopentane	0.000	0.000	0.000
2,3,4- Trimethylpentane & 2,3.Dimethylhexane	0.000	0.000	0.000
Toluene	0.132	0.535	0.044
1,1,2- Trimethylcyclopentane	0.000	0.000	0.000
3,4-Dimethylhexane	0.000	0.000	0.000
2-Methylheptane	0.033	0.166	0.017
4-Methylheptane	0.000	0.000	0.000
1,c-2,t-4- Trimethylcyclopentane	0.000	0.000	0.000
3-Methylheptane & 3,4-Dimethylhexane	0.002	0.010	0.001

Precision parameters apply in the determination of above test results. Also refer to ASTM D 3244-97/02, IP 367/96 and appendix E of IP standard methods for analysis and testing for utilization of test data to determine conformance with specifications.

SGS LABORATORY REFERENCE NUMBER : **6894-250891**

COMPANY: Conoco Phillips **SAMPLE DATE: ########**
AREA / FIELD: Eagleford
LEASE:

	MOL%	WEIGHT%	GPM @ 14.696
1,c-3-Dimethylcyclohexane & 3-Ethylhexane	0.000	0.000	0.000
l,t-4-Dimethylcyclohexane & 1,c2,t3- Trimethylcyclopentane	0.000	0.000	0.000
2,2,5-Trimethylhexane & 1,1-Dimethylcyclohexane	0.000	0.000	0.000
Methyl-Ethylcyclopentane's & 2,2,4- Trimethylhexane	0.017	0.084	0.008
n-Octane	0.057	0.286	0.029
1,t2 Dimethylcyclohexane & 2,2,4,4- Tetramethylpentane	0.000	0.000	0.000
1,t-3-Dimethylcyclohexane & 1,c-4-Dimethylcyclohexane	0.004	0.020	0.002
Dimethylheptanes & 1 ,c-2,c-3- Trimethylcyclopentane	0.002	0.010	0.001
Isopropylcyclopentane	0.003	0.015	0.001
Dimethylheptanes & Trimethylhexanes	0.006	0.033	0.003
1,c-2-Dimethylcyclohexane	0.000	0.000	0.000
Dimethylheptanes	0.007	0.039	0.004
Ethylcyclohexane	0.000	0.000	0.000
n-Propylcyclopentane	0.000	0.000	0.000
Trimethylcyclohexanes	0.000	0.000	0.000
Ethylbenzene	0.006	0.028	0.002
Dimethylheptanes & Trimethylhexanes	0.002	0.011	0.001
m-Xylene & p-Xylene	0.019	0.089	0.007
2 & 4 Methyloctane & 3,4-Dimethylheptane	0.000	0.000	0.000
Trimethylcyclohexanes	0.000	0.000	0.000
3-Methyloctane	0.002	0.011	0.001
Trimethylcyclohexanes	0.000	0.000	0.000
o-Xylene	0.046	0.215	0.018
Trimethylcyclohexanes & Isobutylcyclopentane	0.000	0.000	0.000
n-Nonane	0.020	0.113	0.011
C9 Naphthenes & C10 Paraffins & Trimethylcyclohexanes	0.001	0.006	0.001
Isopropylbenzene & Trimethylcyclohexanes	0.001	0.005	0.000
C9 Naphthenes & C10 Paraffins	0.001	0.006	0.001
Isopropylcyclohexane	0.002	0.011	0.001
C9 Naphthenes & C10 Paraffins & Cyclooctane	0.002	0.010	0.001
N-Propylcyclohexane	0.001	0.006	0.001
C9 Naphthenes & C10 Paraffins & n-Butylcyclopentane	0.003	0.019	0.002
n-Propylbenzene	0.003	0.016	0.001
C9 Naphthenes & C10 Paraffins & EthylBenzenes	0.000	0.000	0.000
m-Ethyltoluene	0.000	0.000	0.000
p-Ethyltoluene	0.000	0.000	0.000
1,3,5- Trimethylbenzene & 4 & 5 Methylnonane	0.000	0.000	0.000
2-Methylnonane & 3-Ethyloctane	0.000	0.000	0.000
C9 Naphthenes & C10 Paraffins	0.000	0.000	0.000
O-Ethyltoluene & 3-Methylnonane	0.000	0.000	0.000
C9 Naphthenes & C10 Paraffins	0.000	0.000	0.000
tert-Butylbenzene	0.000	0.000	0.000
1,2,4 Trimethylbenzene & Methylcyclooctane	0.000	0.000	0.000
Isobutylcyclohexane & tert- Butylcyclohexane	0.000	0.000	0.000
n-Decane Plus	0.004	0.025	0.002
	100.000	100.000	19.664

Precision parameters apply in the determination of above test results. Also refer to ASTM D 3244-97/02, IP 367/96 and appendix E of IP standard methods for analysis and testing for utilization of test data to determine conformance with specifications.

SGS LABORATORY REFERENCE NUMBER : **6894-250891**

COMPANY: Conoco Phillips
AREA / FIELD: Eagleford
LEASE:

SAMPLE DATE: ########

Calculated Value	Total Sample	Heptanes Plus
Molecular Weight	22.736	98.624
Relative Density	0.3670	0.7618
Liquid Density (lbs/gal Absolute Density)	3.060	6.351
Liquid Density (lbs/gal Weight In Air)	3.057	6.345
Cu.Ft./Vapor / Gal. @ 14.696	51.074	24.437
Vapor Pressure @ 100° F	3889.010	1.010
API Gravity at 60° F	254.1	54.2
BTU / LB	21868	12034
BTU / GAL.	66890	72131
BTU / Cu. FT. (Vol. IDEAL Gas Fuel @ 14.696)	1310.2	5205.2
Specific Gravity as a Vapor @ 14.696	0.7850	1.9341

Heavy End Grouping Breakdown

HEXANES	C6	0.733
HEPTANES	C7	0.486
OCTANES	C8	0.343
NONANES	C9	0.117
DECANES+	C10	0.018
	Total	1.697 **Mol%**

BTEX BREAKDOWN

	Mol%	WT.%
BENZENE	0.034	0.117
TOLUENE	0.132	0.535
ETHYLBENZENE	0.006	0.028
XYLENES	0.065	0.304
Total BTEX	**0.237**	**0.984**

Precision parameters apply in the determination of above test results. Also refer to ASTM D 3244-97/02, IP 367/96 and appendix E of IP standard methods for analysis and testing for utilization of test data to determine conformance with specifications.

SGS LABORATORY REFERENCE NUMBER : **6894-250891**

Conoco Phillips

ID:	**Laird B1**	LINE PRESSURE:	**1060 PSI**
AREA:	**Eagleford**	LINE TEMPERATURE:	**112 F**
METER:	**High Pressure Separator**	CYLINDER NUMBER:	**0110**
LEASE:		EFFECTIVE DATE:	
OPERATOR:		SAMPLED BY:	**Robert Hester**
STATION:		ANALYZED BY:	**Kerry Quave**
SAMPLE DATE:	**12/20/2011**	ANALYZED DATE:	**12/24/2011**
SAMPLE OF:	**Gas**	SAMPLE TYPE:	**Spot**

Physical Properties per GPA 2145-09 — Calculations per GPA 2286-03

Note: Zero = Less than detection limit

	MOL%	WEIGHT%	GPM @ 14.696
NITROGEN	0.164	0.202	
CARBON DIOXIDE	2.163	4.187	
METHANE	75.685	53.403	
ETHANE	11.765	15.559	3.151
PROPANE	4.689	9.094	1.294
ISOBUTANE	0.899	2.298	0.295
N-BUTANE	1.663	4.251	0.525
ISOPENTANE	0.652	2.069	0.239
N-PENTANE	0.623	1.977	0.226
HEXANE	0.733	2.778	0.302
HEPTANE	0.486	1.967	0.194
OCTANE	0.343	1.527	0.141
NONANE	0.117	0.584	0.051
DECANE+	0.018	0.104	0.010
	100.000	100.000	6.428

BTU	**Vol. IDEAL Gas Fuel**	**Vol. Real Gas Fuel**
BTU @ 14.696 PSIA (DRY)	1310.2	1315.3
BTU @ 14.696 PSIA (SAT.)	1287.3	1292.9
Specific Gravity	0.7850	0.7878
Compressibility (Z)	0.9961	

Gasoline Content (Gallons Per Thousand - GPM)

Ethane & Heavier	6.032
Propane & Heavier	2.881
Butane & Heavier	1.587
Pentane & Heavier	0.767
Total 26 psi Reid V.P. Gasoline GPM	1.791

Secondary BTU Psia Base	**Vol. IDEAL Gas Fuel**	**Vol. Real Gas Fuel**
BTU @ 15.025 PSIA (DRY)	1339.5	1344.8
BTU @ 15.025 PSIA (SAT.)	1316.1	1321.9
Compressibility (Z) at 15.025 =	0.9960	

Remarks:

Precision parameters apply to the determination of above test results. Also refer to ASTM D 3244-97/02, IP 367/96 and appendix E of IP standard methods for analysis and testing for utilization of test data to determine conformance with specifications.

Remarks:

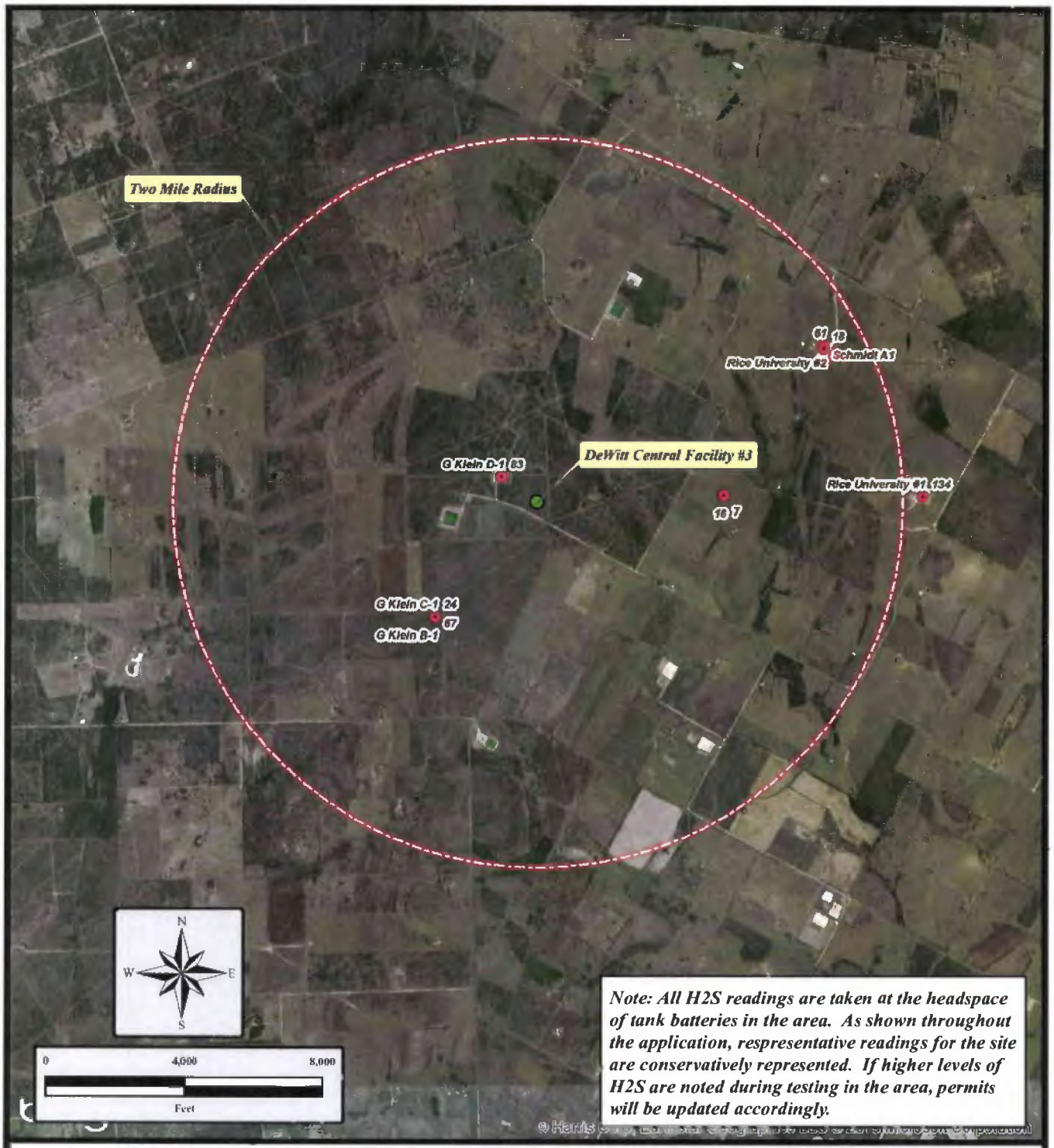


FIGURE 6-1
REPRESENTATIVE H2S METER READING
Burlington Resources Oil & Gas Company LP
Standard Permit Registration
DeWitt Central Facility 3
TITAN Project No. 84800507-12.002
May 2013

from USGS Quadrangle Garfield, Texas
Ground Condition Depicted May 2011
Digital Data Courtesy of ESRI Online Datasets

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